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RESEARCH REPORT

Occupational Mortality in the State of California 1959–1961

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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National Institute for Occupational Safety and Health

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OCCUPATIONAL MORTALITY IN THE STATE OF CALIFORNIA 1959-61

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PREFACE

This project grew out of the prior work of Samuel Milham, Jr., M.D., M.P.H., of the Washington State Department of Social and Health Services, who has provided the Washington State occupational mortality report to allow comparison with the California data, and has collaborated in the analysis of California data and in the preparation of this report.

The California Health and Safety Code states that the Department of Health "shall cause special investigations of the sources of morbidity and mortality and the effect of localities, employments, conditions and circumstances on the public health..." This study was intended to bring existing data on the mortality experience of 125 occupations to the attention of those individuals responsible for the public's health.

Occupation and industry information has been collected on California death certificates since 1905. The first major use of the data was for the study of occupational mortality centered around the 1950 census, (1949-51). On July 20, 1955, the report of the Occupational Classification Study Committee of the State of California Department of Public Health recommended that emphasis should be placed "on obtaining rates for three-year periods centered around the census" with respect to occupation and industry. In June of 1959, Paul Shipley, Chief of the Bureau of Vital Statistics and Data Processing in California, established a committee to consider the special use of the 1960 census to compile statistics on occupational mortality. The coding of the certificates by the staff of the Bureau of Vital Statistics under the direction of the Chief of the Bureau and a committee of public health statisticians and health professionals began in 1960. The coding and editing were completed by the Bureau in 1965. Detailed procedural notes and documents are no longer available.

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This report is presented in one volume consisting of a text section with appendixes and six microfiche filed in the back cover pocket.

ABSTRACT

This report details the occupational and mortality patterns of approximately 200,000 white male residents of California for the period 1959 to 1961, and concludes that occupation can be useful in explaining and interpreting mortality trends; but other factors, such as social and behavioral patterns, may be more important in some cases since it is well known that people do not randomly select their means of support and industry does not randomly hire employees.

The detailed mortality-related statistics derived from death certificates of workers in 125 occupations are furnished in six microfiche as part of the report. They include such information as average age at death, average years worked, and specific causes of death within an occupation that proved to be abnormally high when compared with the same proportional mortality rate of the entire white male population (15-64 years of age) in California.

The data in this report are compared with data from similar occupational mortality reports from Washington State (1950-71), England and Wales (1949-53/1959-63), and the U.S. (1950). In most instances, the California results agree with the other results reported.

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SUMMARY

This report is a snapshot in time of the occupational and mortality patterns of about 200,000 white male residents of California during the period 1959 to 1961. The fundamental method was to compare observed deaths from a specific cause in a defined occupation group with expected deaths in this occupation by that specific cause, assuming that they had the same proportional mortality experience as the entire white male population in California. It is apparent that the high proportion of complete physician certifications and the very high frequency of autopsies suggest that the California cause of death statements are as accurate as any in the United States. The occupation and industry section on the death certificate was almost always completed, allowing adequate coding. In addition, the number of years employed was included in the commentary as an additional aid in the interpretation of the data.

The patterns reported reflect the operation of many factors which have occurred over the decades prior to death. Any use of this report requires that attention be paid to factors other than occupation in explaining (interpreting) the observed patterns of mortality. Social and behavioral factors may be more important than occupation in some cases, since it is well known that people do not randomly select their means of support and industry does not randomly hire employees.

The usefulness of the data in exploring causes of death must be based on the weight of the evidence provided when the California experience is compared with many other sources such as those outlined in the cross reference tables in the Appendix F, given the origins of the data, its high quality, and recognition of its limitations.

INTRODUCTION

The importance of the workplace to the well-being of people has been recognized for hundreds of years. In the 18th century, Bernardino Ramazzini wrote that in addition to asking about signs and symptoms, physicians need to inquire about occupation. He noted a lack of interest in exploring occupation as it related to illness [32]. Alice Hamilton and Harriet Hardy [17], well-known industrial toxicologists, also found this lack of interest to be true in recent years, noting that in their research of medical records there was little interest in the work history of patients. This disinterest is difficult to understand, particularly since epidemiologists have appreciated the value of knowing an individual's occupation and the prevalence of occupations in the population at large. Of the important epidemiologic variables, one of the most practical has proven to be detailed occupational information. It has proved useful as a demographic variable, when hypotheses have been developed as a result of routine tabulations of disease experience in occupation groups, and as a basis for testing hypotheses. Occupation is an important variable, both as a determinant of a person's cancer experience and for investigating cancer etiology [23].

Occupational information can provide clues about the causes of disease. Depending on the accuracy and specificity of the information, it can point to industries or jobs which have characteristic exposures. Once a specific industry or occupation has been identified, it is necessary to pinpoint specific exposures. The need for detailed occupational data was discussed in England as early as 1851 when the Registrar General's Office reported that it was impossible to determine the relative mortality of the persons engaged in silk, cotton, linen, and woolen manufactures, since most were registered as weavers without further distinction [13].

A population can be viewed as a physician views his patient. California's residents can be described in terms of their signs and symptoms, or patterns of morbidity and mortality. Illness registers and death registers provide a chronological history of the population's disease patterns. These registers provide a source of information for identifying relationships between hazards and health effects, and trends in mortality with occupation groups [10]. They are important sources from which public policy for remedial measure originates.

DATA

The primary source of material for this report was the entire death file for the State of California for the years from 1959 to 1961. Over this 3 year period, about 407,000 deaths among California residents were recorded. This study consisted of the subfile of about 199,000 white male decendents 20 years of age or older. The following items of information from each death certificate (Appendix A) were available: 1) County of residence, 2) Age at death, 3) Sex, 4) Color or race, 5) Date of death, 6) Cause of death-ICD 7th revision, 7) Occupation, 8) Industry, 9) Class of worker-government, private, student, etc., and 10) Years in occupation.

DEATH CERTIFICATION

Type of Certifier

In 1962 physician certifiers completed about 75% of the death certificates with the remainder completed by coroners [29]. One-half of the certifying physicians completed 85% of the physician certificates. The physicians as a group were young (67% under 50 years of age), in private practice (80%), and trained in the United States (90%).

ACCURACY OF DEATH CERTIFICATION

Two methods previously used for assessing the accuracy of certification of cause of death included comparing clinical findings with pathologists' reports at post-mortem, and comparing the stated cause of death on the death certificate with data from hospital records. Although no published studies are available for California, two British studies may provide some indication of the general level of accuracy for the time of the deaths included in this occupational mortality study.

In 1959 Heasman and Lipworth conducted a study in 75 hospitals of the British National Health Service, comparing the clinical diagnosis with the post-mortem report [18]. The results indicated disease groups in which there were good agreements between before, and after, autopsy, such as trauma, leukemia, and arteriosclerotic heart disease. Diseases which clinicians tended to diagnose more frequently than pathologists included senility and ill-defined conditions (16X more frequently than pathologists), septicaemia and pyaemia (3X more frequently), and pulmonary embolism and infarction (2X more frequently). Diseases which pathologists diagnosed more frequently included cholelithiasis (3X), broncheactasis (2X), and malignant neoplasms of the kidney (1.3X).

Alderson and Meade examined hospital records and death certificate statements of cause of death in 30 hospitals located in a region of England for the year 1962 [3]. They noted when the findings were discrepant and examined them in relation to demographic measures of the patient such as age, sex, social class, marital status, the type of hospital and speciality, and if an autopsy was performed. They coded the principal condition treated in the hospital and the underlying cause of death for 105 patients. Thirty-nine percent of the cases were discrepant, and these differences were associated with increasing age, indefinite diagnoses, and prolonged stays in hospitals with particular specialties. They noted also that for 22% of the death certificates, the entry did not reflect the clinician's "real opinion". The fewest errors were encountered for malignant neoplasms diagnosed in teaching hospitals. With respect to the death certificate, nearly all errors were due to reporting a complication or incidental condition as the underlying cause of death. They found that 52% of cases reviewed had an autopsy and that using this autopsy data to "correct" the death certificate resulted in changing the cause of death code for one case.

USE OF AUTOPSY IN CERTIFICATION OF CAUSE OF DEATH

Since 1957 the revised California death certificate has asked the certifier if an autopsy was performed and if one was done, whether or not the gross findings were used to determine the cause of death. Less than 2% of the certificates filed did not have this item completed. A U.S. mortality study in 1955 indicated that about 18% did not have this question completed for white male deaths [19].

In 1962 the proportion of California white male deaths in which an autopsy was done was 42% (Appendix B). Autopsy findings were used to determine the cause of death in 35% of all deaths. This is the same relative frequency of autopsies performed among teaching hospitals belonging to the American Hospital Association in 1956 [24]. For States with completion rates over 95% for the autopsy question in 1955, Oregon reported autopsies for 26% of the deaths and Massachusetts reported 20%. The frequency of autopsies was related to anatomic site or cause, age, and race. For example, 94% of the homicides were autopsied as compared to 16% of the central nervous system vascular lesions. Autopsy rates for white males of all ages, all causes, were 42% as compared to 30% for all causes, age 65 and older (Appendix B). In general, up to the fifth decade of life, autopsies were frequently used, and in older age groups the practice was less common.

PROBLEMS IN DEATH CERTIFICATION

Physician attitudes and perceptions about cause of death and the use made of death certificate information influenced their completion of the certificates. In 1962 California physicians were interviewed with respect to problems and attitudes toward death certification [2]. The study reported that most physicians did not possess instructions for completing the certificate, and when they did, they rarely used them. It was not unusual for physicians to consider the effect of the social stigma attached to some causes of death, and therefore carefully assign the cause. Most physicians felt that it was

very difficult to place a definitive cause of death, particularly in older persons. They felt that many disease entities were confusing and did not follow the sequential pattern outlined on the certificate [35]. Many felt that pressure had been exerted on them by morticians to complete the certificate rapidly before additional data were available to determine the most probable cause of death. It was evident that many doctors held the attitude that the accurate assignment of the sequence of events leading to death was not important since even when additional information became available, few of them amended the certificate. This attitude was reflected in statements by them which questioned the usefulness of the data. It was felt that reporting the final events was conditioned by medical training, which differed for doctors trained in different geographic areas.

OCCUPATIONAL SELECTION AND TRANSFER

Occupational mortality studies suggest that observed differences in the mortality pattern within or between occupations primarily reflects variations in specific exposures within or between occupations and only secondarily reflects behavior patterns associated with individuals. This assumption does not actually hold true, since it is known that certain types of individuals select their vocation, or are prescreened by physical examinations as a condition of entry. Disease experiences of persons in the years prior to choosing a vocation play a major role among preselection factors. Similarly, the disease experiences and psychological factors associated with a primary job may aid in determining transfers of certain individuals from one class of occupation to another. This selection leads to the problem of interpreting final jobs, since associations with the final job may lead to false conclusions if the job was entered relatively late in life. In this report, data on the average duration of employment in the last occupation, and the average age at death were provided to aid in judging the findings.

OCCUPATION

Occupational Statement on California Death Certificates

In 1955 the Bureau of Chronic Diseases was awarded a grant from the National Heart Institute to study occupational mortality in California for the years 1949-51. As a preliminary step in the project, the Bureau conducted a study of 407 death certificates of men dying from bronchogenic carcinoma in 1954. The purpose of the study was to ascertain the completeness of occupation and industry reporting on the certificate, and to assess the difficulty in coding occupation relative to deficiencies in the information on industry. This was necessary since the U.S. Census Bureau rules for coding occupation require information on industry in some situations.

Occupational information was not codable in 11.1% of the certificates (Table 1). For persons under age 65, about 9% could not be coded, and for men age 65 and older, approximately 14% could not be coded. Occupation "not stated" or "incomplete" accounted for 6.1% of the uncodable records; lack of industry information rendered occupation not codable in the remaining 5%. It was also seen that for men under the age of 65 years, the proportion of unstated occupations or incomplete occupational information was 3.5% as contrasted with 9.5% on certificates for men aged 65 years and older.

On July 20, 1955 the Occupational Classification Study Committee of the State of California Department of Public Health issued a memorandum supporting a change from asking the usual occupation to asking the last occupation for the 1958 death certificate revision. The basis of the recommendation was a study of lung cancer in which personal antemortem occupational histories of subjects were compared to subsequent death certificate statements. It reported that the tendency was to record the last occupation even though the usual occupation was requested. The agreement for usual occupation was 51%, for the last occupation 70%, and 46% agreed on both usual and last occupation.

On January 1, 1958 the California death certificates included an item for last occupation and duration so that the problems of the last occupations could be assessed. In January of 1959 the Bureau of Records and Statistics for the State assessed the reporting of last occupation, industry, and number of years in the last occupation (Table 2). This represented the death certificates for males registered in April, 1958. Approximately 3.1% had unsatisfactory entries for occupation that were uncodable for some reason, and 6.4% were uncodable for industry. This represented a modest change from the 1954 study, taking into account the addition of local codes such as "never worked", "student", "at home", "retired", "unemployed", and "disabled". For males aged 15-64 years in the 1958 study, the percent of unsatisfactory entries was 2.4% as compared to 9% in the 1954 study.

In summary, about 3-4% of the death certificates for males could not be adequately coded for occupation for the years spanning the early 1950's to the early 1960's. The major proportion of these uncodable certificates were for persons with ill-defined jobs such as "managers", "proprietors", "salespersons", operatives", and "laborers" not classified in other specific categories.

OCCUPATION CODING

The basic coding scheme used was the Bureau of the Census Alphabetical Index of Occupations and Industries as it was used for the 1960 census of population. There were minor alterations in the code numbers, since the Census version contained twelve alphabetic codes which were changed to numeric codes for the project. Additional codes for "student" and "never worked" were created.

Table 1

Reporting Of Occupation Among Males Dying From Bronchogenic Carcinoma, California Death Certificates Registered During the Third Quarter, 1954.

	Age				
	Under 65		65 and Over		All
	Number	Percent	Number	Percent	Percent
Total Death Certificates	288	100.0%	179	100.0%	100.0%
Occupation not codable[1]...	20	9.0	25	14.0	11.1
Not given, incomplete ...	8	3.5	17	9.5	6.1
Not codable because industry not codable ...	12	5.5	8	4.5	5.0

SOURCE: "Level of Reporting Occupation and Industry on Death Certificates." State of California Department of Health Memorandum, dated May 12, 1965. (Occupational Classification Study Committee).

[1]Code in accordance with: Bureau of the Census, "Index of Occupations and Industries 1950." Washington, D.C.: GPO.

Table 2

Reporting of Occupation and Industry for 6,923 Males, Age 15 and Over, California Death Certificates Registered April, 1958.

	Last Occupation	Industry	Number of Years in Occupation
Total	100.0%	100.0%	100.0%
Satisfactory entry	96.9	93.6	85.4
Coded[1]	95.9	92.6	85.4
None, never worked, student[2]	0.9	0.9	-
At home[2]	0.1	0.1	-
Unsatisfactory entry	3.1(a)	6.4	14.6
Unknown, blank, dash	2.1	5.3	12.5
Uncodable entry	0.5	0.8	2.1(b)
Other[2] (retired, unemployed, disabled, inmate)	0.5	0.3	-

Source: "Reporting of Occupation and Industry Information on Death Certificates." State of California, Bureau of Records and Statistics Memorandum dated January 8, 1959.

[1]Coded in accordance with: U.S. Bureau of the Census, "Alphabetical Index of Occupation and Industries, 1950. "Washington, D.C.: GPO.

[2]Codes created locally for satisfactory and unsatisfactory entries.

(a) Unsatisfactory entries noted in 2.4% of males age 15-64, and 3.5% over age 65.

(b) Includes the term "life".

For the purposes of this analysis, the detailed 3-digit codes were occasionally grouped to provide a more logical collection of similar occupations, and to approximate the groups used in other studies. In the commentary these collections were labeled with a "group-code". Every occupation has an associated group-code as shown in Appendix D; in the case of a single occupation, the group code will be the same as the individual code.

METHODS OF ANALYSIS

A number of mortality indices are useful in assessing differences between observed and expected deaths in particular populations or occupational groups. The age-standardized mortality ratio (SMR) is the preferred index since it is a measure of the risk of death from a specific cause. The use of the SMR requires mortality rates for the standard population and the age-specific number of persons at risk of death in each occupation group. There are situations in which the population at risk is not available or when comparability with other studies may be desirable. In these instances the use of the age-standardized proportionate mortality ratio (PMR) is appropriate. The PMR was used here to allow comparison with the Washington State study [28].

The calculation of expected deaths for the age-standardized PMR is shown in Appendix C. The proportion of deaths for each cause within each 5-year age group for all white male deaths in California from 1959 to 1961 served as the standard. This schedule of proportions was applied to the age-specific total deaths among white males in each occupation to calculate expected deaths. Within each age group the proportion of deaths for all causes sums to 1 (i.e., 100 percent). A large excess or deficit from one cause of death or several causes will decrease or increase the proportions dying from other causes. Thus, the PMR indicates only the importance of a specific cause of death relative to other causes in the same occcupation, and does not measure the risk of death or the overall mortality. Comparisons of the PMR and SMR using the same data set and several standard populations have shown that the PMR reflects the SMR when the standard population is similar to the study population [20, 33]. Therefore, the validity of these observations about occupation and cause of death is enhanced by using the California experience as the standard.

A chi-square test for one degree of freedom was applied to the difference between observed and expected deaths in the usual manner:

$$(\text{Observed} - \text{Expected})^2 / \text{Expected}$$

This computation was done using exact expected values when the observed value was 6.0 or greater.

Chi-square values greater than or equal to 3.84 were flagged with an asterisk. This was the value of the statistic selected *a priori* as the decision point to flag or not flag a given PMR. It was selected simply because the chance of claiming a real difference between observed and expected frequencies when there is none should be less than 5%. Within a given occupation group a number of PMR's with chi-square values greater than or equal to 3.84 will occur by chance. No attempt was made in this study to analyze the overall dispersion of significant PMR's in each occupation. For a discussion of an approach to this problem see the Registrar General's Decennial Supplement on occupational mortality [30].

The symbol "R" in the tables represents a PMR calculated from an expected value less than 1. These values were suppressed to avoid flagging many of the ratios as significant when they might not be relatively important. In the tables the expected deaths were rounded after calculation of the chi-squared value. The approximate expected number can be calculated by simple division.

CROSS-REFERENCE TABLE

California occupations have been cross-referenced with four major studies to permit rapid access to them. Appendix E includes in grouped code order the California study, the Washington State study [28], the United States study [15], and the 1949-53/1959-63 British studies [14, 30].

The occupational statements on the death certificates which served as the source of data in these studies are different from each other. In Washington State and for the 1950 U.S. study, the informant was asked for the kind of work the deceased did during most of working life. The instructions given to informants cautioned them not to record preferentially only the highest paid job or the one with the greatest prestige value. In California, they asked for the last occupation. For England and Wales (1949-53), the informant was asked for the occupation at the time of death, or, if retired, the last occupation. For the British 1959-63 study, the informants were asked for the last full-time occupation, and they were told to disregard any subsequent part-time occupation. Retired, unemployed, disabled, incarcerated, and ill persons had the last full-time occupation recorded.

REPORT FORMAT

The report is in Occupational Grouped Code order. Each individual or grouped occupation is introduced by a descriptive title, followed by the number of deaths reported, the average age at death, and the average number of years worked. The important findings for each occupation are described and supporting data provided for aid in interpretation. The following example is illustrative:

Airplane Pilots and Navigators
Occupation Grouped Code 012
Total Deaths: 110
Average Age at Death: 41
Average Years Worked: 14

Sixty-eight of the observed deaths are due to aircraft accidents and only 2 are expected, equivalent to a PMR of approximately 3100. This remarkably high PMR for California is also seen in the Washington State study [28], PMR about 2200, the England and Wales 1959-63 study [30], (SMR about 1800 for accidents other than motor vehicle and those at home), and in New Zealand 1959-63 with an SMR of 1800 for all accidental causes [9].

COMMENTARY:
COMPARISON OF DATA FROM THE CALIFORNIA REPORT
WITH DATA FROM OTHER STATED SOURCES

Accountants, Auditors, and Assessors
Occupation Grouped Code 000
Total Deaths 2,266
Average Age at Death 66
Average Years Worked 29

Significant excess mortality is seen for malignant neoplasms of the urinary bladder, malignant melanoma, multiple sclerosis, amyotrophic lateral sclerosis, coronary heart disease, hypertensive heart disease, bronchitis with emphysema, falls on level surface, and suicide. Coronary heart disease shows a significant elevation in the Washington State data [28].

Actors and Entertainers
Occupation Grouped Code 010
Total Deaths 450
Average Age at Death 67
Average Years Worked 40

Significant excess mortality is seen for cancer of the large intestine except rectum, for chronic rheumatic heart disease and for other diseases of the intestine and peritoneum (ICD 570-578).

Airplane Pilots and Navigators
Occupation Grouped Code 012
Total Deaths 110
Average Age at Death 41
Average Years Worked 14

Sixty-eight of the observed deaths are due to aircraft accidents and only 2 are expected, equivalent to a PMR of approximately 3100. This remarkably high PMR for California is also seen in the Washington State study [28], (PMR about 2200), the England and Wales 1959-63 study [30], (SMR about 1800 for accidents other than motor vehicle and those at home), and in New Zealand 1959-63 with an SMR of 1800 for all accidental causes [9].

Architects
Occupation Code 013
Total Deaths 191
Average Age at Death 71
Average Years Worked 40

Chronic rheumatic heart disease shows a significantly elevated PMR in California.

Artists and Art Teachers
Occupation Code 014
Total Deaths 360
Average Age at Death 66
Average Years Worked 37

Men in this group show a significant excess of deaths due to large bowel cancers.

Chemists
Occupation Code 021
Total Deaths 222
Average Age at Death 64
Average Years Worked 26

Men in this group show excess deaths from chronic nephritis and suicide. Suicide shows a significant excess in the Washington State data [28]. Cancer of the pancreas shows a PMR elevation in both states, supporting the findings of the American Chemical Society study [21].

Chiropractors
Occupation Code 022
Total Deaths 146
Average Age at Death 71
Average Years Worked 34

Chiropractors show a significant excess of rectal cancer deaths in both states.

Clergymen
Occupation Code 023
Total Deaths 909
Average Age at Death 74
Average Years Worked 43

California clergymen show a relative excess mortality, PMR, from diabetes mellitus, also seen in the Washington State study [28], vascular lesions of the central nervous system, cerebral embolism and thrombosis, paralysis agitans, arteriosclerotic heart disease, coronary heart disease, and motor vehicle accidents.

Very low PMR's for lung cancer are seen in California clergymen, and agree with the Washington State study [28], the 1950 U.S. study (SMR) [12], and the 1959-63 British study (SMR [30]. Low ratios were also seen for emphysema without bronchitis, and cirrhosis of the liver.

Cause of Death (ICD-7)	California Deaths			Washington Deaths		
	OBS	EXP	PMR	OBS	EXP	PMR
Cancer of the lung (162.1)	5	19	26	10	25	41
Emphysema (527.1)	1	12	8	3	19	16
Cirrhosis of the liver (581)	6	16	39	4	13	32
Diabetes mellitus (260)	15	8	197	30	21	152

OBS, Observed deaths; EXP, Expected deaths

Professors and Instructors
Occupation Code 060
Total Deaths 599
Average Age at Death 67
Average Years Worked 29

Men in this occupation showed a PMR of 372 for cancer of the brain and nervous system. PMR excesses are seen in both California and Washington State [28] for cancer of the kidney, urinary bladder, malignant melanoma, lymphosarcoma and reticulosarcoma, multiple myeloma, cerebral embolism and thrombosis, chronic rheumatic heart disease, and paralysis agitans.

Dentists
Occupation Code 071
Total Deaths 514
Average Age at Death 72
Average Years Worked 44

Dentists show a significant excess mortality from suicide in California and Washington State [28] as well as an excess ratio for cancer of the pancreas and lymphosarcoma. Chronic rheumatic heart disease and coronary heart disease showed an excess mortality in California.

Draftsmen
Occupation Code 074
Total Deaths 326
Average Age at Death 56
Average Years Worked 22

California draftsmen showed an elevated PMR for total cancers, especially cancers of the lymphatic and hematopoietic tissues, and leukemia. The Washington State data agree with that for the cancers of the lymphatic and hematopoietic tissues and leukemia excesses [28].

Editors and Reporters
Occupation Code 075
Total Deaths 306
Average Age at Death 66
Average Years Worked 30

Cancers of the kidney and urinary bladder show PMR excesses in both the California and Washington State datas [28]. Cancers of the buccal cavity and pharynx show excess mortality in the California file only.

Aeronautical Engineers
Occupation Code 080
Total Deaths 262
Average Age at Death 50
Average Years Worked 14

Men in this group show PMR excesses for the lymphomas, malignant melanoma, cerebral embolism and thrombosis, diseases of the arteries among men under age 65, and suicide.

Civil Engineers
Occupation Code 082
Total Deaths 1,099
Average Age at Death 68
Average Years Worked 33

PMR increases are found for cancer of the gallbladder, malignant melanoma, and lymphatic and hematopoietic tissues in both California and Washington [28]. Paralysis agitans shows a statistically significant excess in both California and Washington. The California data show PMR elevations for chronic rheumatic heart disease and aircraft accidents.

Electrical Engineers
Occupation Code 083
Total Deaths 675
Average Age at Death 61
Average Years Worked 27

Other hypertensive diseases, cancer of the brain, and myeloid leukemia show PMR elevations.

Mechanical Engineers
Occupation Code 085
Total Deaths 515
Average Age at Death 67
Average Years Worked 32

Cancers of the rectum and prostate show increased mortality in the California data as do diseases of the veins and pulmonary emphysema without bronchitis.

Mining Engineers
Occupation Code 091
Total Deaths 260
Average Age at Death 76
Average Years Worked 41

Deaths in men 80 years and over make up 40 percent of the total deaths as compared to 20 percent in the civil engineers. Elevated PMR's are seen for tuberculosis of the respiratory system and cancers of the lymphatic and hematopoietic tissues.

Engineers (n.e.c.)
Occupation Grouped Code 093
Total Deaths 1,023
Average Age at Death 62
Average Years Worked 25

Increased PMR's are seen for cancers of the rectum, brain, liver, malignant melanoma, Hodgkin's disease, acute leukemia, multiple myeloma, diseases of the arteries and other chronic interstitial pneumonia. The Washington State data agree quite well with PMR excesses seen for cancer of the rectum in men under 60 years of age, cancer of the liver, brain, multiple myeloma, and leukemia [28].

Foresters and Conservationists
Occupation Code 103
Total Deaths 183
Average Age at Death 61
Average Years Worked 19

California foresters show elevated PMR's from cancers of the large intestine, rectum, leukemia, aircraft and automobile accidents, and deaths due to fires and explosions. Cancers of the large intestine, rectum, and leukemia show PMR elevations in the Washington State data [28].

Funeral Directors and Embalmers
Occupation Code 104
Total Deaths 130
Average Age at Death 70
Average Years Worked 36

A small number of PMR excess is seen for cancer of the rectum.

Lawyers and Judges
Occupation Code 105
Total Deaths 997
Average Age at Death 71
Average Years Worked 40

Lawyers' and judges' mortality in California is very similar to the Washington data [28] and both files show PMR excesses for cancer of the tongue, large intestine, myeloid leukemia, hyperplasia of the prostate and suicide. The 1959-63 Registrar General's tables [30] support the leukemia and suicide excess. Additionally, malignant melanoma shows an excess in the California data.

Musicians and Music Teachers
Occupation Code 120
Total Deaths 617
Average Age at Death 65
Average Years Worked 42

Men in this group have an excess mortality from cancers of the lymphatic and hematopoietic tissues, alcoholic cirrhosis of the liver and from chronic ulcerative colitis. The Washington State data is comparable [28]. The U.S. study supports the cirrhosis increase [15].

Pharmacists and Druggists
Occupation Code 160
Total Deaths 653
Average Age at Death 70
Average Years Worked 43

Elevated PMR's are seen for cancer of the prostate, lymphatic, leukemia, and suicide. The Washington State data show the leukemia and suicide excess [28].

Photographers
Occupation Grouped Code 161
Total Deaths 389
Average Age at Death 64
Average Years Worked 30

Two non-specific categories, other vascular lesions of the central nervous system and other diseases of the respiratory system, show PMR elevations.

Physicians
Occupation Grouped Code 162
Total Deaths 1,098
Average Age at Death 69
Average Years Worked 41

A suicide excess is seen in California physicians, agreeing with the Washington State [28] U.S. [12], and British data [30]. Other causes with excess mortality are cerebral embolism and thrombosis, leukemia, aircraft accidents, and unspecified falls. The Washington data support the leukemia and aircraft accident excesses [28].

Surveyors
Occupation Code 181
Total Deaths 155
Average Age at Death 60
Average Years Worked 22

Cancer of the stomach has an elevated PMR based on small numbers.

Teachers
Occupation Grouped Code 184
Total Deaths 845
Average Age at Death 65
Average Years Worked 27

The mortality patterns for male school teachers is quite similar in California and Washington [28]. Malignant melanoma, cancer of the brain, lymphosarcoma, Hodgkin's disease, and arteriosclerotic heart disease including coronary disease show PMR elevations in both State files.

Technicians, Medical and Dental
Occupation Code 185
Total Deaths 306
Average Age at Death 58
Average Years Worked 21

No cause of death had a statistically significant excess in the California data.

Professional, Technical and Kindred Workers
Occupation Code 195
Total Deaths 572
Average Age at Death 61
Average Years Worked 22

Cancer of the lung and subarachnoid hemorrhage show increased mortality. The Washington State data support the subarachnoid hemorrhage excess [28].

Farmers
Occupation Code 200
Total Deaths 13,186
Average Age at Death 76
Average Years Worked 43

Cancer of the liver, malignant neoplasms of the skin, asthma, diseases of the thyroid, diabetes mellitus, vascular lesions of the central nervous system, amyotrophic lateral sclerosis, chronic rheumatic heart disease, motor vehicle and machinery accidents show excess mortality. Lung cancer shows a significantly lowered mortality. The Washington State and California data were remarkably similar.

Cause of Death (ICD-7)	Proportional Mortality Ratios	
	California	Washington
Respiratory cancer (160-165)	72*	78*
Cancer of the skin, non-melanoma (191)	155*	136*
Lymphatic leukemia (204.0)	136	135*
Asthma (241)	130*	109
Diseases of the thyroid (250-254)	275*	120
Diabetes mellitus (260)	140*	116
Vascular lesions of the CNS (330-334)	106*	108*
Amyotrophic lateral sclerosis (356.1)	179*	141
Diseases of the heart, other (430-434)	117*	115*
Nephritis and nephrosis (590-594)	128*	120*
Motor vehicle accidents (810-835)	137*	113*
Machinery accidents (912)	462*	389

"*" p-value less than 5%

Buyers and Department Heads
Occupation Code 250
Total Deaths 519
Average Age at Death 64
Average Years Worked 25

Vascular lesions affecting the central nervous system, coronary heart disease, and chronic rheumatic heart disease show elevated PMR's. The coronary heart disease excess is supported by the Washington State data [28].

Buyers and Shippers, Farm Products
Occupation Code 251
Total Deaths 208
Average Age at Death 72
Average Years Worked 34

Cancer of the pancreas and other diseases of the urinary system, nephritis and nephrosis show PMR increases based on small numbers. The Washington State data are quite similar [28].

Railroad Conductors
Occupation Code 252
Total Deaths 531
Average Age at Death 74
Average Years Worked 39

Cerebral hemorrhage and emphysema without bronchitis show significant PMR elevations. Cancer of the lung, suicide, lymphosarcoma and railroad accidents also show mortality excesses. The Washington State data agree with the increases for cancer of the lung, emphysema, and railroad accidents [28].

Inspectors, Public Administration
Occupation Code 260
Total Deaths 495
Average Age at Death 66
Average Years Worked 18

Coronary heart disease, chronic bronchitis, and lymphatic and hematopoietic cancers show elevated PMR's.

Managers and Superintendents, Buildings
Occupation Code 262
Total Deaths 581
Average Age at Death 73
Average Years Worked 19

No remarkable excesses or deficits of mortality are seen.

Officials and Administrators, Public Administration
Occupation Code 270
Total Deaths 759
Average Age at Death 69
Average Years Worked 21

Cancers of the rectum and pancreas, coronary heart disease, and hyperplasia of the prostate show elevated PMR's. The Washington State data agree for all causes except the hyperplasia of the prostate [28].

Officials, Lodge, Society, Union, etc.
Occupation Code 275
Total Deaths 279
Average Age at Death 67
Average Years Worked 18

No causes of death show statistically significant PMR excesses. Subarachnoid hemorrhage shows a small number PMR increase.

Purchasing Agents and Buyers, (n.e.c.)
Occupation Code 285
Total Deaths 377
Average Age at Death 63
Average Years Worked 21

Total malignant neoplasms, cancer of the lung, urinary bladder, and leukemia show statistically significant PMR's. The Washington State data show excellent agreement [28].

Managers, Officials, and Proprietors
Occupation Code 290
Total Deaths 25,986
Average Age at Death 68
Average Years Worked 28

Cancers of the large intestine, pancreas, reticulum-cell sarcoma, other lymphomas, monocytic leukemia, diabetes mellitus, vascular lesions of the central nervous system, coronary heart disease, hypertensive heart disease, and aircraft accidents showed significant PMR excesses. The agreement with the Washington State data is excellent [28].

Agents
Occupation Code 301
Total Deaths 697
Average Age at Death 65
Average Years Worked 22

Hodgkin's disease and arteriosclerotic heart disease, including coronary disease show excess deaths in this group.

Bookkeepers, Cashiers, and Payroll Clerks
Occupation Grouped Code 310
Total Deaths 1,093
Average Age at Death 67
Average Years Worked 22

Only chronic rheumatic heart disease showed a significant PMR excess. Small number PMR increases are seen for cancers of the urinary bladder, malignant melanoma, cancer of the brain, reticulum-cell sarcoma, multiple myeloma, lymphatic leukemia, chronic bronchitis, and chronic nephritis. The urinary bladder excess is also seen in the Washington State data [28] and in other epidemiologic studies [8].

Vehicle Dispatchers and Starters, Traffic Managers
Occupation Code 314
Total Deaths 238
Average Age at Death 59
Average Years Worked 16

Diabetes mellitus and diseases of the arteries show significant PMR excesses in the California data. Small number PMR excesses are seen for cancer of the esophagus, pancreas, kidney, urinary bladder, subarachnoid hemorrhage, and cirrhosis of the liver. The Washington State data agree for cancers of the esophagus, pancreas, urinary bladder, and the subarachnoid hemorrhage excess [28].

Mail Carriers
Occupation Code 323
Total Deaths 549
Average Age at Death 68
Average Years Worked 26

Mail carriers show a significant PMR excess only for cerebral hemorrhage. Cancer of the kidney, paralysis agitans, and bronchiectasis show small number excesses. The Washington State data agree with the kidney cancer excess [28].

Postal Clerks
Occupation Code 340
Total Deaths 535
Average Age at Death 64
Average Years Worked 25

Total malignant neoplasms, cancers of the rectum, kidney, bladder, brain, and Hodgkin's disease show PMR elevations. Duodenal ulcer and suicide also show a mortality excess. In the Washington State data, cancer of the rectum shows a PMR excess for the period 1961-71 as does cancer of the kidney and Hodgkin's disease [28].

Shipping and Receiving Clerks
Occupation Code 343
Total Deaths 651
Average Age at Death 64
Average Years Worked 17

Other hypertensive disease (without mention of heart disease), cancer of the urinary bladder, intestinal obstruction, and amyotrophic lateral sclerosis show PMR excesses. The Washington State data agree for hypertension and amyotrophic lateral sclerosis [28].

Stock Clerks and Storekeepers
Occupation Code 350
Total Deaths 853
Average Age at Death 65
Average Years Worked 14

Chronic rheumatic heart disease and arteriosclerotic heart disease show elevated PMR's.

Telegraph Operators
Occupation Code 352
Total Deaths 197
Average Age at Death 75
Average Years Worked 40

Cancer of the pancreas, urinary bladder, other myocardial degeneration, and pulmonary emphysema show a mortality excess. The bladder cancer excess is also seen in the Washington State tables [28].

Ticket Station and Express Agents
Occupation Code 354
Total Deaths 326
Average Age at Death 71
Average Years Worked 37

Cancer of the large intestine and lung show PMR elevations. The Washington State file supports the large intestine excess [28]. Disease of the arteries also show an excess in both California and Washington State data [28].

Clerical and Kindred Workers
Occupation Code 370
Total Deaths 3,809
Average Age at Death 64
Average Years Worked 19

Multiple sclerosis, diseases of the arteries, and pulmonary emphysema show PMR excesses.

Insurance Agents, Brokers, etc.
Occupation Code 385
Total Deaths 1,227
Average Age at Death 68
Average Years Worked 27

Coronary heart disease is the only cause of death with a significant excess in the California State file. This cause also has a PMR excess in the Washington State file [28].

Newsboys
Occupation Code 390
Total Deaths 224
Average Age at Death 66
Average Years Worked 17

Infective and parasitic disease, including tuberculosis, pulmonary emphysema, and motor vehicle accidents show increased mortality. The Washington State data show the infective and parasitic diseases [28].

Real Estate Agents, etc.
Occupation Code 393
Total Deaths 3,031
Average Age at Death 71
Average Years Worked 23

Cancers of the colon and prostate, lymphosarcoma, cerebral embolism and thrombosis, and coronary heart disease show excess mortality. The Washington State data agree with the lymphosarcoma and coronary heart disease excesses [28].

Sales Clerks
Occupation Code 394
Total Deaths 8,608
Average Age at Death 65
Average Years Worked 24

Men in this group show excess mortality due to cancers of the buccal cavity, pharynx and larynx, and from chronic rheumatic heart disease and diseases of the arteries. The Washington State data agree with the cancer excess and with the chronic rheumatic heart disease excess [28].

Bakers
Occupation Code 401
Total Deaths 692
Average Age at Death 70
Average Years Worked 41

Cancer of the stomach, pneumonia and suicide have high PMR's in the California data.

Blacksmiths
Occupation Code 402
Total Deaths 476
Average Age at Death 77
Average Years Worked 43

Forty percent of the blacksmiths were 80 years of age or older at death. Only chronic nephritis showed a significant PMR excess.

Boilermakers
Occupation Code 403
Total Deaths 452
Average Age at Death 68
Average Years Worked 28

Cancers of the esophagus, lung and urinary bladder, and pulmonary emphysema and bronchiectasis show mortality excesses. The lung excess agrees with the PMR for men aged 20-64 in the 1950 U.S. study [12].

Cause of Death (ICD-7)	California Deaths			Washington Deaths		
	OBS	EXP	PMR	OBS	EXP	PMR
Cancer of the lung (162.1)	17	12	137	37	28	133
Cancer of the urinary bladder (181)	6	3	185	12	8	144
Pulmonary emphysema (527.1)	10	7	146	34	18	184

OBS, Observed deaths; EXP, Expected deaths

Brickmasons, Stonemasons, Tile Setters
Occupation Grouped Code 405
Total Deaths 613
Average Age at Death 69
Average Years Worked 39

Tuberculosis, total cancers, cancers of the respiratory system (primarily lung and bronchus), stomach, prostate, lymphosarcoma, and lymphatic leukemia show excess mortality. The Washington State data [28] agree with the tuberculosis, stomach cancer, and the respiratory cancer excesses, which are reported for California in 1954 [6].

Carpenters
Occupation Code 411
Total Deaths 7,681
Average Age at Death 71
Average Years Worked 35

Cancer of the rectum, esophagus, and stomach (under age 60), malignant melanoma of skin, leukemia, asthma, subarachnoid hemorrhage, acute pancreatitis and accidental falls show a mortality excess. The Washington State data agree with the stomach cancer, melanoma, and accidental fall excesses [28]. The Hodgkin's disease excess seen in Washington State [31] and other files [27] is not seen here. However, the California Hodgkin's PMR is low under age 64. This is similar to the Carpenters' Union Study where Hodgkin's disease PMR's are low below age 64 and high above it [27].

Cement and Concrete Finishers
Occupation Code 413
Total Deaths 338
Average Age at Death 65
Average Years Worked 29

Men in this group show increased mortality from cancer of the pancreas, lymphosarcoma, leukemia, cirrhosis of the liver, other diseases of the urinary system (ICD-7 codes 600-609), and accidental falls.

Cranemen, Derrickmen, and Hoistmen
Occupation Code 415
Total Deaths 289
Average Age at Death 61
Average Years Worked 23

Slight PMR excesses are seen for cancers of the respiratory system [12], brain, leukemia, diseases of the veins, and machinery accidents. The leukemia and accidental death excesses are seen in the Washignton State statistics [28].

Electricians
Occupation Grouped Code 421
Total Deaths 2,068
Average Age at Death 62
Average Years Worked 27

California electricians have increased mortality due to cancers of the lung and urinary bladder, lymphosarcoma, and electrocution. The Washington State data show excellent agreement with excess deaths in each of these causes of death [28], and a recent Los Angeles county study supports the lung cancer excess [26].

Cause of Death (ICD-7)	California Deaths			Washington Deaths		
	OBS	EXP	PMR	OBS	EXP	PMR
Cancer of the lung (162.1)	79	61	129	103	93	110
Cancer of the urinary bladder (181)	25	13	197	29	20	144
Lymphosarcoma (200.1)	10	6	177	13	9	142
Electrocution (914)	13	2	782	14	4	363

OBS, Observed deaths; EXP, Expected deaths

Excavating, Grading, and Road Machinery Operators
Occupation Code 425
Total Deaths 757
Average Age at Death 57
Average Years Worked 21

Machinery accidents, blow from a falling object, and lung cancer show increased mortality in both California and Washington State [28].

Foremen, (n.e.c.)
Occupation Code 430
Total Deaths 3,144
Average Age at Death 65
Average Years Worked 25

Foremen show excess mortality due to cancer of the lung, subarachnoid hemorrhage and arteriosclerotic heart disease. The lung cancer excess is reported in the U.S., 1950 study [12].

Inspectors
Occupation Grouped Code 450
Total Deaths 951
Average Age at Death 64
Average Years Worked 20

Cancers of the lung and brain, leukemia, and chronic rheumatic heart disease show increased mortality. The Washington State data agree with the lung and brain cancer excesses [28].

Jewelers, Watchmakers, Goldsmiths, Silversmiths, and Watchsmiths
Occupation Code 451
Total Deaths 261
Average Age at Death 67
Average Years Worked 37

Tuberculosis, chronic-rheumatic heart disease, arteriosclerotic heart disease, and kidney infection show elevated PMR's. The Washington State file also shows the tuberculosis and rheumatic heart disease excesses [28].

Linemen and Servicemen, Telegraph, Telephone, and Power
Occupation Code 453
Total Deaths 564
Average Age at Death 62
Average Years Worked 28

Accidental falls from one level to another and electrocution show excess mortality in both files. Coronary heart disease, nephritis, and nephrosis show an excess in the California data. Both California and Washington [28] have PMR increases due to pulmonary embolism, infarction, and brain cancer.

Locomotive Engineers and Firemen
Occupation Grouped Code 454
Total Deaths 855
Average Age at Death 72
Average Years Worked 37

The California data show elevated PMR's for blood and blood-forming organs and unspecified cancers.

Machinists
Occupation Grouped Code 465
Total Deaths 4,165
Average Age at Death 65
Average Years Worked 26

Lung cancer and benign neoplasms show excess deaths. The Washington data show a PMR increase for lung cancer in the 1950-60 time period [28].

Mechanics and Repairmen, Airplane
Occupation Code 471
Total Deaths 468
Average Age at Death 54
Average Years Worked 14

Cancer of the pancreas, pulmonary emphysema, and aircraft accidents show excess mortality.

Mechanics and Repairmen, Automobile
Occupation Grouped Code 472
Total Deaths 1,833
Average Age at Death 60
Average Years Worked 27

Cancer of the esophagus, diseases of the respiratory system, and motor vehicle accidents show increased mortality. The Washington State data agree for the esophageal cancer and motor vehicle accident [28].

Mechanics and Repairmen, Radio and Television
Occupation Code 474
Total Deaths 229
Average Age at Death 52
Average Years Worked 16

Diseases of the circulatory system and diseases of the arteries have increased PMR's.

Mechanics and Repairmen (n.e.c.)
Occupation Grouped Code 480
Total Deaths 4,645
Average Age at Death 64
Average Years Worked 17

Cancer of the lung [12, 26], myeloid leukemia, and appendicitis show elevated PMR's. The Washington State data agree with the lung cancer and leukemia excesses [28].

Millwrights
Occupation Code 491
Total Deaths 207
Average Age at Death 69
Average Years Worked 28

Diseases of the arteries show a significant PMR excess. Chronic rheumatic heart disease and accidental falls show PMR increases in both California and Washington State [28].

Metal Molders
Occupation Code 492
Total Deaths 211
Average Age at Death 69
Average Years Worked 34

Tuberculosis, lung cancer, pulmonary emphysema, and silicosis show excess mortality in both the California and Washington files [28]. The U.S. [12, 15] and British [30] studies show a similar pattern.

Cause of Death (ICD-7)	California Deaths			Washington Deaths		
	OBS	EXP	PMR	OBS	EXP	PMR
Tuberculosis (001-008)	6	1	427	6	2	288
Cancer of the lung (162.1)	10	5	186	13	8	163
Pulmonary emphysema (527.1)	6	3	192	8	6	132
Silicosis (523.0)	5	0	R	7	0	R

OBS, Observed deaths; EXP, Expected deaths; R, PMR not calculated

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Plasterers and Lathers
Occupation Code 505
Total Deaths 464
Average Age at Death 68
Average Years Worked 40

Cancer of the lung, lymphosarcoma, and pneumonia show excess mortality. The Washington file [28], U.S. 1950 study [12], and a Los Angeles count study [26] agree.

Plumbers and Pipefitters
Occupation Grouped Code 510
Total Deaths 1,771
Average Age at Death 66
Average Years Worked 29

Respiratory cancer, cancer of the bone, bronchiectasis, and pulmonary emphysema have increased mortality. The Washington State file [28] agrees for lung cancer and emphysema. A Los Angeles county study [26] and an earlier California study which was adjusted for smoking practices [11] also support the lung cancer excess.

Pressmen and Plate Printers
Occupation Grouped Code 512
Total Deaths 1,144
Average Age at Death 67
Average Years Worked 39

Vascular lesions of the central nervous system, non-alcoholic cirrhosis of the liver, and duodenal ulcer had elevated PMR's. The Washington State file agrees with the cirrhosis excess [28].

Roofers and Slaters
Occupation Code 514
Total Deaths 236
Average Age at Death 56
Average Years Worked 22

Increased PMR's are seen for lung cancer in California State and a recent Los Angeles county study [26]. Cerebral hemorrhage, pulmonary emphysema, cirrhosis of the liver, and accidental falls, also show increased PMR's in California. The Washington State data agree very well [28].

Cause of Death (ICD-7)	California Deaths			Washington Deaths		
	OBS	EXP	PMR	OBS	EXP	PMR
Respiratory cancer (160-165)	15	11	138	29	19	155
Asthma (241)	2	1	R	7	2	455
Pulmonary emphysema (527.1)	5	3	176	12	6	197
Cirrhosis of the liver (581)	18	9	202	10	7	151
Accidental falls (900-904)	7	2	297	16	5	332

OBS, Observed deaths; EXP, Expected deaths; R, PMR not calculated

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Shoemakers and Repairers
Occupation Code 515
Total Deaths 419
Average Age at Death 72
Average Years Worked 39

Increased PMR's are seen for cancers of the large intestine, prostate, and diabetes mellitus. Diabetes shows a PMR increase in the Washington State data [28].

Stationary Engineers
Occupation Grouped Code 520
Total Deaths 1,867
Average Age at Death 69
Average Years Worked 25

Lung cancer shows PMR increases in this and several other [6, 11] California studies, as well as the Washington State and U.S. [15] data for stationary engineers. Cancer of the pancreas shows a small PMR increase in the California data paralleling a larger increase in the Washington State data [28]. Amyothrophic lateral sclerosis also shows small PMR increases in California and Washington State.

Structural Metal Workers
Occupation Grouped Code 523
Total Deaths 745
Average Age at Death 64
Average Years Worked 22

Both in California and Washington State [28] files agree on excess mortality from accidental falls and lymphatic leukemia. Lung cancer and suicide have increased PMR's in the California data.

Tailors
Occupation Grouped Code 524
Total Deaths 964
Average Age at Death 74
Average Years Worked 51

Cancer of the kidney and arteriosclerotic heart disease have elevated PMR's.

Tinsmiths, Coppersmiths, and Sheet Metal Workers
Occupation Grouped Code 525
Total Deaths 827
Average Age at Death 63
Average Years Worked 26

Other myocardial degeneration and accidental falls show PMR increases. Cancers of the rectum and lung show moderate PMR increases in the California data and significant excesses in the Washington State data [28]. Accidental mortality due to falls is also significant in the Washington file. The U.S. data show the lung cancer excess [12].

Toolmakers, Die Makers, and Setters
Occupation Code 530
Total Deaths 630
Average Age at Death 63
Average Years Worked 27

Cancers of the urinary bladder, lung, and subarachnoid hemorrhage have elevated PMR's. Lung cancer PMR's are also elevated in the Washington State data [28].

Upholsterers
Occupation Code 535
Total Deaths 345
Average Age at Death 66
Average Years Worked 32

Suicide, brain cancer, and esophageal cancer show PMR excesses based on small numbers.

Craftsmen and Kindred Workers
Occupation Code 545
Total Deaths 579
Average Age at Death 67
Average Years Worked 30

Cancer of the rectum, pulmonary embolism, and suicide show PMR elevations.

Officers and Enlisted Men, Armed Forces
Occupation Code 555
Total Deaths 3,102
Average Age at Death 47
Average Years Worked 19

Aircraft accidents, cirrhosis of the liver, pulmonary emphysema, acute leukemia, brain cancer, and cancer of the rectum show PMR excesses.

Assemblers and Graders
Occupation Code 631
Total Deaths 592
Average Age at Death 56
Average Years Worked 10

Cancers of the lung and testis, leukemia, diseases of the blood- forming organs and other myocardial degeneration show excess mortality.

Attendants; Auto Service, Parking, Gas Station
Occupation Grouped Code 632
Total Deaths 566
Average Age at Death 52
Average Years Worked 9

Tumors of the pharynx, lung and testis, cirrhosis of the liver, and homicide show elevated PMR's. Small PMR increases are seen in both California and Washington State [28] for cancers of the pharynx, urinary bladder, and testis.

Railroad Brakemen
Occupation Code 640
Total Deaths 285
Average Age at Death 70
Average Years Worked 30

Diabetes mellitus, cirrhosis of the liver, and railroad accidents show excess mortality.

Bus Drivers
Occupation Code 641
Total Deaths 343
Average Age at Death 61
Average Years Worked 18

Lung cancer, subarachnoid hemorrhage, and coronary heart disease show PMR elevations in California, Washington State [28], and the 1950 U.S. study [12].

Conductors; Bus and Street Railway
Occupation Code 645
Total Deaths 141
Average Age at Death 76
Average Years Worked 29

Leukemia shows a PMR increase.

Deliverymen and Routemen
Occupation Code 650
Total Deaths 608
Average Age at Death 59
Average Years Worked 18

Cancer of the stomach, larynx, and brain, lymphosarcoma, multiple myeloma, and homicide show elevated PMR's.

Laundry and Dry Cleaning Operatives
Occupation Code 674
Total Deaths 549
Average Age at Death 66
Average Years Worked 25

Lymphatic leukemia, emphysema, and infections of the kidney showed PMR elevations. Solvent exposure and lymphatic leukemia have been reported previously [25]. The Washington file agrees with the emphysema excess [28].

Meat Cutters, except slaughterhouse
Occupation Code 675
Total Deaths 991
Average Age at Death 67
Average Years Worked 38

Cancers of the buccal cavity, pharynx, larynx, and kidney, and ulcer of the stomach have elevated PMR's in the California file. The buccal cavity and laryngeal cancer excesses are also seen in Washington State [28].

Mine Operatives and Laborers
Occupation Code 685
Total Deaths 1,518
Average Age at Death 71
Average Years Worked 33

Respiratory tuberculosis, lung cancer, silicosis, chronic interstitial pneumonia, machinery accidents, and homicide show increased mortality. The Washington State [28], U.S. [15], British [14, 30], and New Zealand [9] studies show excellent agreement with this pattern. Unpublished mortality data for California (1959-61) among men 20-64 years of age indicates an SMR of 447 for tuberculosis, and an SMR of 241 for respiratory cancer. A high lung cancer SMR is reported for Los Angeles county [26].

Cause of Death (ICD-7)	California Deaths			Washington Deaths		
	OBS	EXP	PMR	OBS	EXP	PMR
Tuberculosis (001-008)	34	9	358	74	14	522
Respiratory cancer (160-165)	76	58	132	141	101	140
Silicosis (523.0)	23	1	R	42	2	2511
Chronic bronchitis (502)	4	3	134	14	7	206
Chronic interstitial pneumonia (525)	12	3	375	17	7	261
Emphysema (527.1)	28	21	131	51	40	126
Other accidents (910-936)	35	14	248	55	31	178
Homicide (980-985)	8	4	202	6	3	179

OBS, Observed deaths; EXP, Expected deaths; R, PMR not calculated

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Motormen; Street, Subway and Elevated Railway
Occupation Grouped Code 691
Total Deaths 230
Average Age at Death 75
Average Years Worked 31

Cancers of the rectum and brain and arteriosclerotic heart disease show small PMR excesses.

Oilers and Greasers, except auto
Occupation Code 692
Total Deaths 154
Average Age at Death 59
Average Years Worked 14

Job related accidental deaths (ICD-7 codes 910-936) are in excess.

Packers and Wrappers
Occupation Code 693
Total Deaths 260
Average Age at Death 66
Average Years Worked 17

Leukemia shows a small PMR excess in both California and Washington State [28].

Painters, except construction and maintenance
Occupation Grouped Code 694
Total Deaths 3,558
Average Age at Death 66
Average Years Worked 31

Painters show an excess of lung cancer, alcoholic cirrhosis of the liver, and accidental falls in California and Washington State [28]. The lung cancer excess is also seen in British data [14, 30], a Los Angeles county study [26], and other studies which took smoking into account [11, 37].

Sailors, Deck Hands, and Seamen (n.e.c.)
Occupation Grouped Code 703
Total Deaths 1,046
Average Age at Death 64
Average Years Worked 30

These men had excess mortality due to respiratory tuberculosis, cancers of the esophagus, stomach, and larynx. Disorders of character, behavior, and intelligence, pulmonary emphysema, alcoholic cirrhosis, acute pancreatitis, and accidental falls show increased deaths. The Washington State data [28] show essentially the same pattern of mortality.

Railroad Switchmen
Occupation Code 713
Total Deaths 359
Average Age at Death 66
Average Years Worked 29

Lung cancer, pulmonary emphysema, and railway accidents show elevated PMR's.

Taxicab Drivers
Occupation Code 714
Total Deaths 646
Average Age at Death 61
Average Years Worked 18

Asthma, chronic bronchitis, diseases of the veins, and homicide show increased deaths.

Truck and Tractor Drivers
Occupation Grouped Code 715
Total Deaths 3,032
Average Age at Death 54
Average Years Worked 18

Lung cancer, multiple myeloma, motor vehicle accidents, blow from falling objects, and machinery accidents have increased deaths. The agreement with the Washington State file is good [28], and a Los Angeles county study agrees with the lung cancer excess [26].

Welders and Flame Cutters
Occupation Code 721
Total Deaths 863
Average Age at Death 55
Average Years Worked 19

Pulmonary emphysema, accidental deaths due to fire and explosion, and suicide have significant PMR increases. Cancers of the kidney, Hodgkin's disease and acute leukemia show small PMR increases. There is good general agreement with Washington State [28].

Operatives and Kindred Workers
Occupation Code 775
Total Deaths 7,336
Average Age at Death 64
Average Years Worked 23

Cancers of the salivary gland, hypopharynx, stomach, liver, larynx, cholecystitis and alcoholic cirrhosis of the liver showed increased mortality.

Attendants, Hospital and Institution
Occupation Grouped Code 810
Total Deaths 210
Average Age at Death 63
Average Years Worked 13

Other myocardial degeneration and pulmonary emphysema have increased mortality. The Washington State study [28] agrees for the emphysema.

Attendants, Recreation and Amusement
Occupation Code 813
Total Deaths 237
Average Age at Death 61
Average Years Worked 13

Tuberculosis, cancer of the urinary bladder, and cirrhosis of the liver have excess mortality in both California and Washington State [28]. The 1959-63 British study [30] also shows good agreement.

Barbers
Occupation Grouped Code 814
Total Deaths 1,483
Average Age at Death 69
Average Years Worked 43

Cancer of the rectum, bronchiectasis, and calculi of the kidney have increased deaths.

Bartenders
Occupation Code 815
Total Deaths 1,108
Average Age at Deat 59
Average Years Worked 19

Cancers of the buccal cavity and pharynx, cancer of the larynx, diabetes mellitus, avitaminosis, metabolic diseases, alcoholic cirrhosis of the liver, and homicide show PMR elevations in both California and Washington State [28]. Respiratory cancer and diabetes mellitus are high in the 1959-63 British study [30].

Cause of Death (ICD-7)	California Deaths			Washington Deaths		
	OBS	EXP	PMR	OBS	EXP	PMR
Cancer of the buccal cavity and pharynx (140-148)	15	7	202	22	10	210
Cancer of the larynx (161)	7	3	236	11	4	264
Diabetes mellitus (260)	14	10	140	45	26	170
Avitaminoses (280-289)	5	2	255	6	2	242
Cirrhosis of the liver (581)	119	44	271	104	34	304
Homicide (980-985)	10	6	158	16	6	253

OBS, Observed deaths; EXP, Expected deaths

Cooks, Chefs (except private household), Counter and Fountain Workers
Occupation Grouped Code 825
Total Deaths 2,188
Average Age at Death 65
Average Years Worked 29

Respiratory tuberculosis, cancers of the pharynx, esophagus, liver, gallbladder, and ampulla of Vater, asthma, disorders of character, behavior, and intelligence, pneumonia, pulmonary emphysema, cholelithiases, and accidental falls show excess mortality. The Washington State [28], U.S. [15] and British [30] data show good agreement. The unpublished data for California 1949-51 support the respiratory and accidental death excess. New Zealand [9] data show marked elevation of SMR's for respiratory, digestive systems and accidents.

Elevator Operators
Occupation Code 831
Total Deaths 438
Average Age at Death 71
Average Years Worked 14

Cirrhosis of the liver and accidental falls from one level to another show PMR increases.

Janitors and Sextons
Occupation Code 834
Total Deaths 3,205
Average Age at Death 70
Average Years Worked 12

Tuberculosis, cancers of the buccal cavity and pharynx, reticulosarcoma, asthma, myeloid leukemia, and diseases of the male genital organs show PMR increases. The buccal cavity and pharynx cancers and reticulum-cell sarcoma increases are also seen in the Washington State study [28].

Kitchen Workers
Occupation Code 835
Total Deaths 742
Average Age at Death 64
Average Years Worked 12

Tuberculosis, pneumonia, other diseases of the respiratory system, gastric ulcer, hyperplasia of the prostate, accidental falls, and deaths due to fire and explosion are in excess.

Firemen and Fire Protection
Occupation Code 850
Total Deaths 560
Average Age at Death 65
Average Years Worked 24

Cancer of the lung, also seen in 1954 California study [6], lymphosarcoma and diseases of the arteries have excess mortality. Lung cancer is also increased in the U.S. data [12].

Guards, Watchmen, and Doorkeepers
Occupation Grouped Code 851
Total Deaths 2,746
Average Age at Death 71
Average Years Worked 11

Lymphosarcoma (age 64 or older), other myocardial degeneration, acute pancreatitis, and kidney infections show mortality elevations. The U.S. [15] British [30] and Washington State data are similar [28].

Policemen and Detectives
Occupation Grouped Code 853
Total Deaths 1,261
Average Age at Death 65
Average Years Worked 19

Arteriosclerotic heart disease including coronary disease, lymphatic leukemia, and homicide show PMR elevations. The Washington State pattern is similar [28].

Waiters
Occupation Code 875
Total Deaths 448
Average Age at Death 66
Average Years Worked 31

Tuberculosis, cancer of the esophagus, cirrhosis of the liver, nephritis, nephrosis and homicide show PMR excesses.

Service Workers, except private household
Occupation Code 890
Total Deaths 357
Average Age at Death 62
Average Years Worked 16

Tuberculosis, liver cancer, and accidental falls show PMR elevations.

Farm Laborers
Occupation Grouped Code 902
Total Deaths 6,567
Average Age at Death 64
Average Years Worked 30

Tuberculosis, cancer of the liver (metastatic and unspecified), disorders of character, behavior, and intelligence, pneumonia, gastric ulcer, intestinal obstruction, kidney infections, prostatic hyperplasia, motor vehicle, machinery, and fire related accidents, and homicide have PMR elevations. This pattern is very similar to the Washington State pattern. In New Zealand [9], respiratory mortality along with accidental causes is high relative to the all-cause SMR.

Fishermen and Oystermen
Occupation Code 962
Total Deaths 361
Average Age at Death 66
Average Years Worked 34

Total cancer, cancers of the stomach, lung, kidney, and urinary bladder show excess deaths. Duodenal ulcer and accidental death drowning also show PMR elevations. The Washington State pattern is similar [28]. This occupation shows excesses for lung cancer in the 1950 U.S. study [15].

Gardeners
Occupation Code 964
Total Deaths 1,454
Average Age at Death 71
Average Years Worked 20

Cancers of the esophagus, stomach (ages 20-64), liver, and bone show PMR elevations. Cholelithiasis and suicide also have increased mortality. The Washington State data [28] agree with the stomach cancer excess.

Longshoremen and Stevedores
Occupation Code 965
Total Deaths 706
Average Age at Death 65
Average Years Worked 28

Cancer of the rectum, cirrhosis of the liver, kidney infections, and accidental falls show elevated PMR's. The Washington State data [28] agree with the cirrhosis and fall excesses.

Lumbermen, Raftsmen, and Woodchoppers
Occupation Code 970
Total Deaths 598
Average Age at Death 63
Average Years Worked 26

Tuberculosis, lymphatic leukemia, chronic interstitial pneumonia, job related accidents, and homicide show increased mortality. Category 910, blows from a falling object, had 42 deaths observed to 1 expected. The Washington State file is similar [28].

Cause of Death (ICD-7)	California Deaths			Washington Deaths		
	OBS	EXP	PMR	OBS	EXP	PMR
Tuberculosis (001-008)	8	4	194	74	57	130
Cancer of the stomach (151)	9	8	112	223	186	120
Lymphatic leukemia (204.0)	4	1	392	18	14	128(1961-71)
Bronchiectasis (526)	1	1	90	31	16	199
Chronic interstitial pneumonia (525)	4	1	321	24	26	94
Blow from falling object (910)	42	1	R	368	34	1075

OBS, Observed deaths; EXP, Expected deaths; R, PMR not calculated

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Laborers
Occupation Code 985
Total Deaths 10,627
Average Age at Death 65
Average Years Worked 22

Tuberculosis, cancers of the buccal cavity, pharynx, stomach, biliary passages, liver (primary), and skin show PMR increases. Avitaminosis, psychosis, pulmonary emphysema, cirrhosis of the liver, and job related accidents show excess deaths.

Students
Occupation Code 998
Total Deaths 374
Average Age at Death 20

Total cancers show an excess due to cancers of the brain and bone. Diseases of the blood and blood-forming organs, nephritis, nephrosis, and suicide also have more deaths than expected.

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CERTIFICATE OF DEATH

STATE FILE NUMBER | STATE OF CALIFORNIA—DEPARTMENT OF PUBLIC HEALTH | LOCAL REGISTRATION DISTRICT AND CERTIFICATE NUMBER

DECEDENT PERSONAL DATA

1a. NAME OF DECEASED—FIRST NAME	1b. MIDDLE NAME	1c. LAST NAME	2a. DATE OF DEATH—MONTH, DAY, YEAR	2b. HOUR
				M.

3. SEX	4. COLOR OR RACE	5. BIRTHPLACE (STATE OR FOREIGN COUNTRY)	6. DATE OF BIRTH	7. AGE (LAST BIRTHDAY) YEARS	IF UNDER 1 YEAR: MONTHS / DAYS	IF UNDER 24 HOURS: HOURS / MINUTES

8. NAME AND BIRTHPLACE OF FATHER	9. MAIDEN NAME AND BIRTHPLACE OF MOTHER

10. CITIZEN OF WHAT COUNTRY	11. SOCIAL SECURITY NUMBER	12. MARRIED, NEVER MARRIED, WIDOWED, DIVORCED (SPECIFY)	13. NAME OF SURVIVING SPOUSE (IF WIFE, ENTER MAIDEN NAME)

14. LAST OCCUPATION	15. NUMBER OF YEARS IN THIS OCCUPATION	16. NAME OF LAST EMPLOYING COMPANY OR FIRM (IF SELF EMPLOYED, SO STATE)	17. KIND OF INDUSTRY OR BUSINESS

PLACE OF DEATH

18a. PLACE OF DEATH—NAME OF HOSPITAL OR OTHER IN-PATIENT FACILITY	18b. STREET ADDRESS—(STREET AND NUMBER, OR LOCATION)	18c. INSIDE CITY CORPORATE LIMITS (SPECIFY YES OR NO)

18d. CITY OR TOWN	18e. COUNTY	18f. LENGTH OF STAY IN COUNTY OF DEATH YEARS	18g. LENGTH OF STAY IN CALIFORNIA YEARS

USUAL RESIDENCE (IF DEATH OCCURRED IN INSTITUTION, ENTER RESIDENCE BEFORE ADMISSION)

19a. USUAL RESIDENCE—STREET ADDRESS (STREET AND NUMBER OR LOCATION)	19b. INSIDE CITY CORPORATE LIMITS (SPECIFY YES OR NO)	20. NAME AND MAILING ADDRESS OF INFORMANT

19c. CITY OR TOWN	19d. COUNTY	19e. STATE

PHYSICIAN'S OR CORONER'S CERTIFICATION

21a. CORONER: I HEREBY CERTIFY THAT DEATH OCCURRED AT THE HOUR, DATE AND PLACE STATED ABOVE FROM THE CAUSES STATED BELOW AND THAT I HAVE HELD ON THE REMAINS OF DECEASED AS REQUIRED BY LAW AM (INVESTIGATION OR INQUEST)	21b. PHYSICIAN: I HEREBY CERTIFY THAT DEATH OCCURRED AT THE HOUR, DATE, AND PLACE STATED ABOVE. FROM THE CAUSES STATED BELOW AND THAT I ATTENDED THE DECEASED: FROM (ENTER MONTH, DAY, YEAR) TO (ENTER MONTH, DAY, YEAR) AND LAST SAW THE DECEASED ON (ENTER MONTH, DAY, YEAR)	21c. PHYSICIAN OR CORONER—SIGNATURE AND DEGREE OR TITLE ▲	21d. DATE SIGNED
		21e. ADDRESS	21f. PHYSICIAN'S CALIFORNIA LICENSE NUMBER

FUNERAL DIRECTOR AND LOCAL REGISTRAR

22a. SPECIFY BURIAL, ENTOMBMENT OR CREMATION	22b. DATE	23. NAME OF CEMETERY OR CREMATORY	24. EMBALMER—SIGNATURE (IF BODY EMBALMED) LICENSE NUMBER

25. NAME OF FUNERAL DIRECTOR (OR PERSON ACTING AS SUCH)	26. IF NOT CERTIFIED BY CORONER, WAS THIS DEATH REPORTED TO CORONER (SPECIFY YES OR NO)	27. LOCAL REGISTRAR—SIGNATURE ▲	28. DATE ACCEPTED FOR REGISTRATION BY LOCAL REGISTRAR

MEDICAL AND HEALTH DATA

CAUSE OF DEATH

29. PART I. DEATH WAS CAUSED BY: ENTER ONLY ONE CAUSE PER LINE FOR A, B, AND C

CONDITIONS, IF ANY, WHICH GAVE RISE TO THE IMMEDIATE CAUSE (A), STATING THE UNDERLYING CAUSE LAST.		APPROXIMATE INTERVAL BETWEEN ONSET AND DEATH
IMMEDIATE CAUSE	(A)	
DUE TO, OR AS A CONSEQUENCE OF	(B)	
DUE TO, OR AS A CONSEQUENCE OF	(C)	

30. PART II: OTHER SIGNIFICANT CONDITIONS—CONTRIBUTING TO DEATH BUT NOT RELATED TO THE IMMEDIATE CAUSE GIVEN IN PART I	31. WAS OPERATION OR BIOPSY PERFORMED FOR ANY CONDITION IN ITEMS 29 OR 30? (SPECIFY OPERATION AND/OR BIOPSY)	32a. AUTOPSY (SPECIFY YES OR NO)	32b. IF YES, WERE FINDINGS CONSIDERED IN DETERMINING CAUSE OF DEATH? (SPECIFY YES OR NO)

INJURY INFORMATION

33. SPECIFY ACCIDENT, SUICIDE OR HOMICIDE	34. PLACE OF INJURY (SPECIFY HOME, FARM, FACTORY, FREEWAY, HIGHWAY, STREET, OFFICE BUILDING, ETC.)	35. INJURY AT WORK (SPECIFY YES OR NO)	36a. DATE OF INJURY—MONTH, DAY, YEAR	36b. HOUR
				M.

37a. PLACE OF INJURY (STREET AND NUMBER OR LOCATION AND CITY OR TOWN)	37b. DISTANCE FROM PLACE OF INJURY TO USUAL RESIDENCE ITEM 19 MILES	38. WERE LABORATORY TESTS DONE FOR DRUGS OR TOXIC CHEMICALS (SPECIFY YES OR NO)	39. WERE LABORATORY TESTS DONE FOR ALCOHOL? (SPECIFY YES OR NO)

40. DESCRIBE HOW INJURY OCCURRED (ENTER SEQUENCE OF EVENTS WHICH RESULTED IN INJURY. NATURE OF INJURY SHOULD BE ENTERED IN ITEM 29)

APPENDIX B

Age-specific Relative Frequency of Autopsy for Selected Causes of Death
Among White Male Residents of California, 1962

Seventh Revision International List Number	Cause of Death	Age					
		All Ages	Under 35	35-44	45-54	55-64	65 & Over
241,501,502.1, 502.7,525,526, 527.1	Chronic Obstructive Respiratory Diseases	46.3	92.4	68.4	55.9	44.6	38.4
581	Cirrhosis of Liver	62.1	80.0	69.6	64.7	59.4	56.4
140-205	Malignant Neoplasms	37.7	56.5	54.7	48.0	40.9	31.7
330-334, 440-468, 592,594	Cardiovascular-Renal Diseases	32.2	78.3	65.3	52.0	42.1	24.6
420	Arteriosclerotic Heart Disease	35.5	81.1	65.1	52.5	43.4	27.9
421-422	Chronic Endocarditis and Myocarditis	14.6	83.3	35.7	18.2	15.3	13.0
440-447	Hypertensive Diseases	30.4	57.1	58.0	53.2	41.1	23.6
450	General Arteriosclerosis	18.7	100.0	100.0	35.7	41.8	16.8
	All Causes	41.8	67.4	67.5	57.2	46.0	29.8

Source: Shipley, P. W., and Norris, F. D., 1964. Medical Certification of Death. Appendix A "Deaths from Selected Chronic Diseases and Percent Autopsied by Race, Sex and Age: California, 1962." Berkeley: State of California, Department of Public Health.

APPENDIX C

Computation of Age-standardized Proportionate Mortality Ratio for Tuberculosis, All Forms, for White Miners: United States, 1950. Modified from Guralnick [15].

Age	Age-specific percent tuberculosis deaths of all deaths all occupations Combined	Deaths from all causes for white miners	Expected deaths from tuberculosis, all forms, for white miners	Reported deaths from tuberculosis, all forms, for white miners
	(1)	(2)	(3)=(1)x(2)	(4)
20-24	6.28	292	18.34	10
25-29	8.30	357	29.63	20
30-34	9.01	341	30.72	22
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
60-64	2.77	2951	56.81	104
20-64			370.47	540

Age-standardized proportionate mortality ratio: $\frac{540}{370.47} \times 100 = 144$

APPENDIX D

Occupation Group Codes, Individual Codes, and Titles

Codes		
Group	Individual	Title
000	000	Accountants and auditors
	042	Professors and instructors, mathematics
	135	Mathematicians
	174	Statisticians and actuaries
010	010	Actors
	101	Entertainers (n.e.c.)
012	012	Airplane pilots and navigators
013	013	Architects
014	014	Artists and art teachers
021	021	Chemists
022	022	Chiropractors
023	023	Clergymen
060	060	Professors and instructors, subject not specified
	030	College presidents and deans
	031	Professors & instructors, agricultural sciences
	130	Natural scientists, agricultural
	032	Professors & instructors, biological sciences
	131	Natural scientists, biological
	035	Professors & instructors, economics
	172	Economists
	040	Professors & instructors, engineering
	041	Professors & instructors, geology and geophysics
	134	Natural scientists, geologists and geophysicists
	043	Professors & instructors, medical sciences
	045	Professors & instructors, physics
	140	Natural scientists, physicists
	050	Professors & instructors, psychology
	173	Psychologists
	052	Professors & instructors, natural sciences (n.e.c.)
	145	Natural scientists, miscellaneous
	053	Professors & instructors, social sciences (n.e.c.)
	175	Miscellaneous social scientists
	054	Professors & instructors, nonscientific subjects
071	071	Dentists
074	074	Draftsmen

Codes		
Group	Individual	Title
075	075	Editors and reporters
080	080	Engineers, aeronautical
082	082	Engineers, civil
083	083	Engineers, electrical
085	085	Engineers, mechanical
091	091	Engineers, mining
093	093	Engineers (n.e.c.)
	084	Engineers, industrial
	090	Engineers, metallurgical, and metallurgists
	092	Engineers, sales
103	103	Foresters and conservationists
104	104	Funeral directors and embalmers
105	105	Lawyers and judges
120	120	Musicians and music teachers
160	160	Pharmacists
161	161	Photographers
	695	Photographic process workers
162	162	Physicians and surgeons
	153	Osteopaths
181	181	Surveyors
184	184	Teachers (n.e.c.)
	182	Teachers, elementary schools
	183	Teachers, secondary schools
185	185	Technicians, medical and dental
195	195	Professional, technical, and kindred workers (n.e.c.)
200	200	Farmers (owners and tenants)
250	250	Buyers and department heads, store
251	251	Buyers and shippers, farm products
252	252	Conductors, railroad

Codes		
Group	Individual	Title
260	260	Inspectors, public administration
262	262	Managers and superintendents, building
270	270	Officials and administrators (n.e.c.), public administration
275	275	Officials, lodge, society, union, etc.
285	285	Purchasing agents and buyers (n.e.c.)
290	290	Managers, officials, and proprietors (n.e.c.)
301	301	Agents (n.e.c.)
310	310	Bookkeepers
	312	Cashiers
	333	Payroll and timekeeping clerks
314	314	Dispatchers and starters, vehicle
323	323	Mail carriers
340	340	Postal clerks
343	343	Shipping and receiving clerks
350	350	Stock clerks and storekeepers
352	352	Telegraph operators
354	354	Ticket, station, and express agents
370	370	Clerical and kindred workers
385	385	Insurance agents, brokers, and underwriters
390	390	Newsboys
393	393	Real estate agents and brokers
394	394	Salesmen and sales clerks (n.e.c.)
401	401	Bakers
402	402	Blacksmiths
403	403	Boilermakers
405	405	Brickmasons, stonemasons, and tile setters
	602	Apprentice bricklayers and masons

Codes		
Group	Individual	Title
411	411	Carpenters
	410	Cabinetmakers
	603	Apprentice carpenters
	960	Carpenters' helpers, except logging and mining
413	413	Cement and concrete finishers
415	415	Cranemen, derrickmen, and hoistmen
421	421	Electricians
	190	Technicians, electrical and electronic
	604	Apprentice electricians
425	425	Excavating, grading, and road machinery operators
430	430	Foremen (n.e.c.)
450	450	Inspectors (n.e.c.)
	643	Checkers, examiners, and inspectors, manufacturing
451	451	Jewelers, watchmakers, goldsmiths, and silversmiths
453	453	Linemen and servicemen, telegraph, telephone and power
454	454	Locomotive engineer
	460	Locomotive firemen
465	465	Machinists
	605	Apprentice machinists and toolmakers
471	471	Mechanics and repairmen, airplane
472	472	Mechanics and repairmen, automobile
	475	Mechanics and repairmen, railroad and car shop
474	474	Mechanics and repairmen, radio and television
480	480	Mechanics and repairmen, (n.e.c.)
	470	Mechanics and repairmen, air conditioning, heating and refrigeration
	473	Mechanics and repairmen, office machine
	610	Apprentice mechanics, except auto
491	491	Millwrights
492	492	Moulders, metal

Codes		
Group	Individual	Title
493	493	Motion picture projectionists
505	505	Plasterers
510	510	Plumbers and pipe fitters
	612	Apprentice plumbers and pipe fitters
512	512	Pressmen and plate printers, printing
	414	Compositors and typesetters
	423	Electrotypers and stereotypers
	615	Apprentices, printing trades
514	514	Roofers and slaters
515	515	Shoemakers and repairers, except factory
520	520	Stationary engineers
	701	Power station operators
	712	Stationary firemen
523	523	Structural metal workers
	452	Job setters, metal
	614	Apprentices, metalworking trades (n.e.c.)
	653	Filers, grinders, and polishers, metal
524	524	Tailors
	651	Dressmakers, except factory
	680	Milliners
	705	Sewers and stitchers, manufacturing
	710	Spinners, textile
	720	Weavers, textile
525	525	Tinsmiths, coppersmiths, and sheet metal workers
	513	Rollers and roll hands, metal
530	530	Toolmakers, and die makers and setters
535	535	Upholsterers
545	545	Craftsmen and kindred workers (n.e.c.)
555	555	Armed forces
631	631	Assemblers
632	632	Attendants, auto service and parking
	963	Garage laborers, and car washers and greasers
640	640	Brakemen, railroad

Codes		
Group	Individual	Title
641	641	Bus drivers
645	645	Conductors, bus and street railway
650	650	Deliverymen and routemen
674	674	Laundry and dry cleaning operatives
675	675	Meat cutters, except slaughter and packing house
685	685	Mine operatives and laborers (n.e.c.)
691	691	Motormen, street, subway, and elevated railway
	690	Motormen, mine, factory, logging camp, etc.
692	692	Oilers and greasers, except auto
693	693	Packers and wrappers (n.e.c.)
694	694	Painters, except construction and maintenance
	495	Painters, construction and maintenance
703	703	Sailors and deck hands
	265	Officers, pilots, pursers, and engineers, shop
	635	Boatmen, canalmen, and lock keepers
704	704	Sawyers
713	713	Switchmen, railroad
714	714	Taxicab drivers and chauffeurs
715	715	Truck and tractor drivers
	971	Teamsters
	972	Truck drivers' helpers
721	721	Welders and flame-cutters
775	775	Operatives and kindred workers (n.e.c.)
810	810	Attendants, hospital and other institutions
	812	Attendants, professional and personal service (n.e.c.)
813	813	Attendants, recreation and amusement
	812	Ushers, recreation and amusement
814	814	Barbers
	843	Hairdressers and cosmetologists

Codes		
Group	Individual	Title
815	815	Bartenders
825	825	Cooks, except private household
	830	Counter and fountain workers
831	831	Elevator operators
834	834	Janitors and sextons
835	835	Kitchen workers (n.e.c.), except private household
850	850	Firemen, fire protection
851	851	Guards, watchmen, and doorkeepers
	860	Watchmen (crossing) and bridge tenders
853	853	Policemen and detectives
	852	Marshals and constables
	854	Sheriffs and bailiffs
875	875	Waiters
890	890	Service workers, except private household (n.e.c.)
902	902	Farm laborers, wage workers
	901	Farm foremen
	903	Farm laborers, unpaid family workers
	905	Farm service laborers, self-employed
962	962	Fishermen and oystermen
964	964	Gardeners, except farm and groundskeepers
965	965	Longshoremen and stevedores
970	970	Lumbermen, raftsmen, and wood-choppers
985	985	Laborers (n.e.c.)
998	998	Student

APPENDIX E

OCCUPATIONAL CROSS REFERENCE TABLE

California State Occupational Mortality Study 1959-61, Washington State Study 1950-71, United States 1950 Study, and the Registrar General's Studies 1949-53 and 1959-63.

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 000	CODE 000 PAGE 5	CODE 01-00 PAGE 137	CODE 364 PAGE 185	CODE 296 PAGE 195
Accountants, auditors, actuaries, mathematicians and statisticians	Accountants, auditors, assessors, actuaries, mathematicians and statisticians	Accountants and auditors	Qualified accountants	Professional accountants, company secretaries and registrars
CODE 010			CODE 844 PAGE 186	CODE 294 PAGE 194
Actors and entertainers			Actors, variety artists, entertainers	Stage managers, actors, entertainers, musicians
CODE 012	CODE 012 PAGE 5			CODE 192 PAGE 169
Airplane pilots and navigators	Airplane pilots and navigators			Aircraft pilots, navigators and flight engineers
CODE 013	CODE 013 PAGE 5	CODE 01-01 PAGE 138	CODE 385 PAGE 184	CODE 297 PAGE 195
Architects	Architects	Architects	Architects, town planners, ship designers, surveyors	Surveyors, architects
CODE 014	CODE 014 PAGE 5	CODE 01-02 PAGE 139	CODE 368 PAGE 185	CODE 295 PAGE 195
Artists and art teachers	Artists and art teachers	Artists and art teachers	Painters, sculptors, and engravers	Painters, sculptors, and related artists
CODE 021	CODE 021 PAGE 6	CODE 01-04 PAGE 141	CODE 360 PAGE 184	CODE 292 PAGE 194
Chemists	Chemists	Chemists	Chemists (not pharmaceutical)	Chemists, physical and biological sciences

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 022	CODE 022 PAGE 6			
Chiropractors	Chiropractors			
CODE 023	CODE 023 PAGE 6	CODE 01-05 PAGE 142	CODE 85 PAGE 134	CODE 298 PAGE 196
Clergymen	Clergymen	Clergymen	Clergymen (Church of England)	Clergy, ministers, members of religious orders
CODE 060	CODE 060 PAGE 7	CODE 01-06 PAGE 145	CODE 91 PAGE 140	CODE 286 PAGE 192
Professors, Instructors Natural Scientists, Social Scientists	Professors and Instructors	College presidents, professors and instructors	Teachers	University teachers
CODE 071	CODE 071 PAGE 7	CODE 01-07 PAGE 146	CODE 352 PAGE 184	CODE 281 PAGE 190
Dentists	Dentists	Dentists	Dental practitioners	Dental Practitioners
CODE 074	CODE 074 PAGE 7	CODE 01-08	CODE 359 PAGE 184	CODE 312 PAGE 197
Draftsmen	Draftsmen	Designers and draftsmen	Industrial designers, draughtsmen	Draughtsmen
CODE 075	CODE 075 PAGE 7	CODE 01-03 PAGE 140	CODE 365 PAGE 185	CODE 293 PAGE 194
Editors and reporters	Editors and reporters	Authors, editors, and reporters	Authors, journalists, and publicists	Authors, journalists, and related workers
CODE 080		CODE 01-09 PAGE 148		
Aeronautical engineers		Engineers, aeronautical		

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 082	CODE 082 PAGE 8	CODE 01-10 PAGE 149		CODE 288 PAGE 192
Civil engineers	Civil engineers	Engineers, civil		Civil, structural, municipal engineers
CODE 083	CODE 083 PAGE 8	CODE 01-11 PAGE 150	CODE 92 PAGE 141	CODE 290 PAGE 193
Electrical engineers	Electrical engineers	Engineers, electrical	Professional engineers and surveyors	Electrical engineers
CODE 085	CODE 085 PAGE 8	CODE 01-12 PAGE 151	CODE 92 PAGE 141	CODE 289 PAGE 193
Mechanical engineers	Mechanical engineers	Engineers, mechanical	Professional engineers and surveyors	Mechanical engineers
CODE 091		CODE 01-13 PAGE 152		
Mining engineers		Other technical engineers		
CODE 093	CODE 093 PAGE 8	CODE 01-13	CODE 92 PAGE 141	
Engineers NEC	Engineers NEC	Other technical engineers	Professional engineers and surveyors	
CODE 103	CODE 103 PAGE 8		CODE 117 PAGE 160	CODE 005 PAGE 133
Foresters and conservationists	Foresters and conservationists		Foresters and woodmen	Foresters and woodmen
CODE 104	CODE 104 PAGE 9		CODE 393 PAGE 188	
Funeral directors and embalmers	Funeral directors		Funeral directors and assistants	

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 105	CODE 105 PAGE 9	CODE 01-14 PAGE 153	CODE 88 PAGE 137	CODE 299 PAGE 196
Lawyers and judges	Lawyers and judges	Lawyers and judges	Judges, barristers, etc. solicitors	Judges, barristers, advocates, soliciters
CODE 120	CODE 120 PAGE 9	CODE 01-15 PAGE 154	CODE 375 PAGE 186	CODE 294 PAGE 194
Musicians, music teachers	Musicians, music teachers	Musicians, music teachers	Musicians	Stage managers, actors entertainers, musicians
CODE 160	CODE 160 PAGE 9	CODE 01-17 PAGE 156	CODE 354 PAGE 184	CODE 283 PAGE 191
Pharmacists	Pharmacists and druggists	Pharmacists	Pharmacists	Pharmacists, dispensers
CODE 161	CODE 161 PAGE 10	—	CODE 385 PAGE 187	
Photographers	Photographers		Photographers	
CODE 162	CODE 162 PAGE 10	CODE 01-18 PAGE 157	CODE 89 PAGE 138	CODE 280 PAGE 190
Physicians	Physicians and surgeons	Physicians and surgeons	Registered medical practitioners, radiologists	Medical practitioners, qualified
CODE 181		CODE 01-21 PAGE 160	CODE 358 PAGE 184	CODE 297 PAGE 195
Surveyors		Surveyors	Architects, town planners, ship designers, surveyors	Surveyors, architects
CODE 184	CODE 184 PAGE 10	CODE 01-22 PAGE 161	CODE 91 PAGE 140	CODE 287 PAGE 192
Teachers	Teachers	Teachers	Teachers (not music)	Teachers NEC

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 185 Technicians, medical and dental	CODE 185 PAGE 10 Technicians, medical and dental	CODE 01-23 PAGE 162 Technicians, medical and dental	CODE 356 PAGE 184 Other medical auxiliaries	CODE 285 PAGE191 Medical workers NEC
CODE 195 Professional, technical and kindred workers NEC		CODE 01-24 PAGE 163 Other professional, technical and kindred workers		CODE 311 PAGE 197 Professional workers NEC
CODE 200 Farm owners and tenants	CODE 200 PAGE 11 Farmers NEC	PAGE 135 Farmers and farm laborers	CODE 1 PAGE 50 Farmers, farm managers	CODE 002 PAGE 132 Agricultural workers NEC
CODE 250 Buyers and department heads, store	CODE 250 PAGE 13 Buyers and department heads, store		CODE 330 PAGE 181 Buyers, advertising agents and managers	
CODE 251 Buyers and shippers, farm products	CODE 251 PAGE 13 Buyers and shippers, farm products			
CODE 252 Railroad conductors	CODE 252 PAGE 13 Railroad conductors		CODE 308 PAGE 179 Ticket collectors and examiners	
CODE 260 Inspectors, public administration		CODE 03-00 PAGE 164 Officials and inspectors, state and local administration		

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 262 Building managers and superintendents				
CODE 270 Officials and administrators, public administration NEC	CODE 270 PAGE 14 Officials and administrators, public administration	CODE 03-00 PAGE 164 Officials and inspectors, state and local administration	CODE 66 PAGE 115 Civil service and local authority, administrative and executive officers	CODE 223 PAGE 177 Civil servants, local authority officials
CODE 275 Officials; lodge, society, union	CODE 275 PAGE 14 Officials; lodge, society, union			
CODE 285 Purchasing agents and buyers NEC	CODE 285 PAGE 14 Purchasing agents and buyers NEC		CODE 331 PAGE 182 Sales managers (manufacturers)	CODE 276 PAGE 189 Sales Managers
CODE 290 Managers, officials, proprietors NEC		CODE 03-31 PAGE 168 Managers, officials, and proprietors NEC, wholesale and retail trade	CODE 420 PAGE 190 Managers NES	CODE 278 PAGE 189 Managers NEC
CODE 301 Agents NEC				
CODE 310 Bookkeepers, cashiers, payroll clerks and timekeeping clerks	CODE 310 PAGE 15 Bookkeepers, cashiers and payroll clerks	CODE 04-00 PAGE 171 Bookkeepers	CODE 395 PAGE 188 Costing and accounting clerks	CODE 221 PAGE 176 Clerks, cashiers, office machine operators

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 314 Dispatchers and starters, vehicle	CODE 314 PAGE 15 Dispatchers and starters, vehicle			CODE 200 PAGE 172 Traffic controllers and dispatchers, transport
CODE 323 Mail carriers	CODE 323 PAGE 16 Mail carriers	CODE 04-01 PAGE 172 Mail carriers	CODE 74 PAGE 123 Postmen, post office sorters	CODE 203 PAGE 173 Postmen, mail sorters
CODE 340 Postal clerks	CODE 340 PAGE 16 Postal clerks		CODE 74 PAGE 123 Postmen, post office sorters	CODE 203 PAGE 173 Postmen, mail sorters
CODE 343 Shipping and receiving clerks	CODE 343 PAGE 16 Shipping and receiving clerks			
CODE 350 Stock clerks and storekeepers	CODE 350 PAGE 16 Stock clerks and storekeepers, warehousemen		CODE 397 PAGE 188 Storekeepers	CODE 210 PAGE 175 Warehousemen, storekeepers and assistants
CODE 352 Telegraph operators	CODE 352 PAGE 16 Telegraph operators		CODE 327 PAGE 181 Radio and telegraph operators	CODE 202 PAGE 281 Telegraph and radio operators
CODE 354 Ticket, station and express agents	CODE 354 PAGE 17 Ticket, station and express agents		CODE 308 PAGE 179 Ticket collectors and examiners	

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 385	CODE 385 PAGE 17	CODE 05-00 PAGE 176	CODE 84 PAGE 133	CODE 238 PAGE 180
Insurance agents, brokers, underwriters	Insurance agents, brokers, underwriters, appraisers	Insurance agents and brokers	Insurance agents, brokers and canvassers	Finance, insurance brokers, financial agents
CODE 390	CODE 390 PAGE 18		CODE 82 PAGE 131	CODE 235 PAGE 179
Newsboys	Newsboys		Costermongers, newspaper sellers, other hawkers	Street vendors, hawkers
CODE 393	CODE 393 PAGE 18	CODE 05-01 PAGE 177	CODE 349 PAGE 183	CODE 239 PAGE 180
Real estate agents and brokers	Real estate agents and brokers	Real estate agents and brokers	Auctioneers, estate agents, valuers	Salesmen, services; valuers and auctioneer
CODE 394	CODE 396 PAGE 18	CODE 05-32 PAGE 181	CODE 343 PAGE 183	CODE 233 PAGE 178
Salesmen and sales clerks NEC	Sales clerks NEC	Salesmen and sales clerks (NEC) retail trade	Salesmen, shop assistants, etc.	Shop salesmen and assistants, non-food
CODE 401	CODE 401 PAGE 18	CODE 06-00 PAGE 183	CODE 52 PAGE 101	CODE 120 PAGE 156
Bakers	Bakers	Bakers	Bakers, pastry cooks, etc.	Bakers, pastry cooks
CODE 402	CODE 402 PAGE 19	CODE 06-01 PAGE 184	CODE 195 PAGE 168	CODE 043 PAGE 139
Blacksmiths	Blacksmiths	Blacksmiths, forgemen, and hammermen	Blacksmiths	Smiths, forgemen
CODE 403	CODE 403 PAGE 19	CODE 06-02 PAGE 185		
Boilermakers	Boilermakers	Boilermakers		

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 405	CODE 405 PAGE 19	CODE 06-74 PAGE 200	CODE 59 PAGE 108	CODE 150 PAGE 161
Brickmasons, stonemasons, tile setters	Brickmasons, stonemasons, tile setters	Masons, tile setters and stone cutters	Bricklayers	Bricklayers, tile setters
CODE 411	CODE 411 PAGE 20	CODE 06-04	CODE 54 PAGE 103	CODE 080 PAGE 149
Carpenters and cabinet makers	Carpenters, cabinet makers	Carpenters	Carpenters, joiners	Carpenters and joiners
CODE 413	CODE 413 PAGE 20	CODE 06-82 PAGE 210	CODE 292 PAGE 178	CODE 152 PAGE 162
Cement and concrete finishers	Cement and concrete finishers	Plasterers and cement finishers	Plasterers	Plasterers, cement finishers, terazzo workers
CODE 415	CODE 415 PAGE 20	CODE 06-06 PAGE 191	CODE 109 PAGE 158	CODE 171 PAGE 164
Cranemen, derrickmen and hoistmen	Cranemen, derrickmen, hoistmen	Cranemen, hoistmen and construction machinery operators	Drivers of stationary engines and cranes, etc.	Crane and hoist operators, slingers
CODE 421	CODE 421 PAGE 21	CODE 06-07 PAGE 192	CODE 34 PAGE 83	CODE 052 PAGE 141
Electricians	Electricians	Electricians	Electricians (house, ship, factory)	Electricians
CODE 425	CODE 425 PAGE 21		CODE 299 PAGE 178	CODE 172 PAGE 165
Excavating, grading and road machinery operators	Excavators, graders, pavers highway maintenance		Pavers, street masons, and asphalters	Operators of earth moving and other construction equipment

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 510	CODE 510 PAGE 26	CODE 06-83 PAGE 211	CODE 29 PAGE 78	CODE 070 PAGE 146
Plumbers and pipefitters	Plumbers, pipefitters	Plumbers, pipefitters	Plumbers (not chemical plumbers	Plumbers, lead burners, pipefitters
CODE 512	CODE 512 PAGE 26	CODE 06-84	CODE 57 PAGE 106	CODE 134 PAGE 159
Pressmen, plate printers, compositors and electro-typers	Pressmen and plate printers, printing	Printing craftsmen except compositors and typesetters	Printing machine minders, etc., printers	Printers (so described)
CODE 514	CODE 514 PAGE 26			
Roofers and slaters	Roofers and slaters			
CODE 515	CODE 515 PAGE 26	CODE 06-85 PAGE 213	CODE 47 PAGE 96	CODE 091 PAGE 151
Shoemakers, shoe repair (non-factory)	Shoemakers and repairers, leatherworkers	Shoemakers and repairers, except factory	Boot and shoemakers and repairers (not factory)	Shoemakers and shoe repairers
CODE 520	CODE 520 PAGE 27	CODE 06-86 PAGE 214	CODE 109 PAGE 158	CODE 174 PAGE 165
Stationary engineers and firemen, power station operators	Stationary engineers and firemen	Stationary engineers	Drivers of stationary engines	Stationary engine, materials, handling plant operators, etc.
CODE 523	CODE 523 PAGE 27	CODE 06-87 PAGE 215		
Structural metal workers, job setters, filer, grinder, polisher	Structural metal workers	Structural metal workers		
CODE 524	CODE 524 PAGE 27	CODE 06-88 PAGE 216	CODE 50 PAGE 99	CODE 110 PAGE 155
Tailors, dressmakers (non-factory), milliners, sewers, stitchers (mfg), spinners and weavers	Tailors	Tailors and furriers	Tailors	Tailors, dress, light clothing makers

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 525 Tinsmiths, coppersmiths and sheet metal workers	CODE 525 PAGE 28 Tinsmiths, coppersmiths and sheet metal workers	CODE 06-89 PAGE 217 Tinsmiths, coppersmiths and sheet metal workers	CODE 200 PAGE 168 Sheet iron and sheet metal workers	CODE 060 PAGE 142 Sheet metal workers
CODE 530 Toolmakers, and die-makers and setters	CODE 530 PAGE 28 Tool and die makers and setters	CODE 06-90 PAGE 218 Toolmakers, and die makers and setters	CODE 25 PAGE 74 Precision fitters, tool makers, gunsmiths, etc.	CODE 066 PAGE 144 Tool makers, tool-room fitters
CODE 535 Upholsterers	CODE 535 PAGE 29 Upholsterers		CODE 257 PAGE 174 Upholsterers, coach trimmers, etc.	CODE 111 PAGE 155 Upholsterers and related workers
CODE 545 Craftsmen and kindred workers NEC	CODE 545 PAGE 29 Craftsmen and kindred workers	CODE 06-91 PAGE 219 Other craftsmen and kindred workers		CODE 142 PAGE 161 Craftsmen NEC
CODE 555 Armed forces	CODE 555 PAGE 29 Officers and enlisted men; Air Force, Army and Marine Corps			CODE 320 PAGE 198 Armed Forces (U.K.)
CODE 631 Assemblers			CODE 930 PAGE 189 Assemblers, NES	
CODE 632 Attendants, auto service, parking, gas station	CODE 632 PAGE 30 Attendants, auto service, parking, gas station	CODE 07-01 PAGE 221 Attendants, auto service, and parking		

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 640	CODE 640	CODE 07-02 PAGE 222		
Railroad brakemen	Railroad brakemen	Brakemen and switchmen, railroad		
CODE 641	CODE 641 PAGE 31	CODE 07-03 PAGE 223	CODE 315 PAGE 180	CODE 195 PAGE 170
Bus drivers	Bus drivers	Bus drivers	Drivers of trams and trolleybuses	Drivers of buses, coach and trams
CODE 645			CODE 317 PAGE 180	
Conductors; bus and street railway			Bus and tram conductors	
CODE 650	CODE 650 PAGE 31		CODE 344 PAGE 183	
Deliverymen and routemen	Deliverymen and routemen		Roundsmen, van salesmen	
CODE 674	CODE 674 PAGE 32	CODE 07-06 PAGE 227	CODE 389 PAGE 187	CODE 264 PAGE 185
Laundry and dry cleaning operatives	Laundry and dry cleaning operatives	Laundry and dry cleaning operatives	Laundry workers	Launderers, dry cleaners and pressers
CODE 675	CODE 675 PAGE 32	CODE 07-07 PAGE 229	CODE 267 PAGE 175	CODE 121 PAGE 157
Meatcutters, except slaughterhouse	Meatcutters and butchers	Meatcutters, except slaughter and packing house	Slaughterhouse workers	Butchers and meatcutters
CODE 685	CODE 685 PAGE 32	CODE 07-08 PAGE 230	CODE 119 PAGE 160	CODE 013 PAGE 135
Mine operatives and laborers	Mine operatives and laborers	Mine operatives and laborers NEC	Coal cutting etc., machine men below ground	Coal miners (so described)

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 691		CODE 07-09 PAGE 233		
Motormen; street, subway and elevated railway		Motormen, street, subway and elevated railway		
CODE 692	CODE 692 PAGE 33		CODE 405 PAGE 189	CODE 174 PAGE 165
Oilers and Greasers, except auto	Oilers and Greasers, except auto		Oilers and greasers of machinery (not in mines)	Stationary engineers, material handling plant operators NEC; oilers and greasers.
CODE 693	CODE 693 PAGE 33		CODE 399 PAGE 188	CODE 211 PAGE 176
Packers and wrappers	Packers and wrappers		Packers and bottlers	Packers, labellers, etc.
CODE 694	CODE 694 PAGE 33	CODE 07-10 PAGE 234	CODE 65 PAGE 114	CODE 161 PAGE 163
Painters, except construction and maintenance	Painters	Painters, except construction and maintenance	Other painters and decorators	Painters, decorators NEC
CODE 703	CODE 703 PAGE 33	CODE 07-12 PAGE 236	CODE 322 PAGE 181	CODE 191 PAGE 169
Sailors, deckhands, and seamen NEC	Sailors, deckhands, and seamen NEC	Sailors and deckhands	Bargemen, boatsmen, tugmen	Deck and engineroom ratings, barge and boatmen
CODE 713		CODE 07-02 PAGE 222		
Switchmen, railroad		Brakemen and switchmen, railroad		

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 714	CODE 714 PAGE 34	CODE 07-16 PAGE 241	CODE 72 PAGE 121	CODE 196 PAGE 171
Taxicab drivers and chauffeurs	Taxicab drivers and chauffeurs	Taxicab drivers and chauffeurs	Drivers of self propelled passengers and goods vehicles	Drivers of other road passenger vehicles
CODE 715	CODE 715 PAGE 34	CODE 07-17 PAGE 244	CODE 72 PAGE 121	CODE 197 PAGE 171
Truck and tractor drivers	Truck and tractor drivers	Truck drivers and delivery-men	Drivers of self propelled passengers and goods vehicles	Drivers of road goods vehicles
CODE 721	CODE 721 PAGE 35	CODE 07-18 PAGE 246	CODE 37 PAGE 86	CODE 063 PAGE 143
Welders and flame cutters	Welders and flame cutters	Welders and flame cutters	Oxyacetylene or electric welders	Gas, electric, welders cutters; braziers
CODE 775	CODE 722 PAGE 35	CODE 07-19 PAGE 247		
Operatives and kindred workers NEC	Operatives and kindred workers NEC	Other specified operatives and kindred workers		
CODE 810	CODE 810 PAGE 35		CODE 385 PAGE 187	CODE 266 PAGE 186
Attendants, hospital and institution	Attendants, hospital and institution		Hospital or ward orderlies, attendants	Hospital or ward orderlies; ambulance men
CODE 813	CODE 813 PAGE 36			CODE 267 PAGE 186
Attendants, recreation and amusement	Attendants, recreation and amusement			Service, sport and recreation workers NEC
CODE 814	CODE 814 PAGE 36	CODE 09-00 PAGE 271	CODE 105 PAGE 154	CODE 263 PAGE 185
Barbers	Barbers	Barbers, beauticians, manicurists	Barbers, hairdressers and manicurists	Hairdressers, manicurists, beauticians

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 815	CODE 815 PAGE 36	CODE 09-07 PAGE 283	CODE 103 PAGE 152	CODE 254 PAGE 182
Bartenders	Bartenders	Waiters, bartenders and counter workers	Barmen	Barmen
CODE 825	CODE 825 PAGE 37	CODE 09-02 PAGE 276		CODE 257 PAGE 183
Cooks and chefs (except private household), counter and fountain workers	Cooks and candy makers	Cooks, (except private household)		Cooks
CODE 831		CODE 09-03 PAGE 278		
Elevator operators		Elevator operators		
CODE 834	CODE 834 PAGE 37	CODE 09-01 PAGE 272		CODE 260 PAGE 184
Janitors and sextons	Janitors, maintenance men and sextons	Janitors and porters		Caretakers, office keepers
CODE 835	CODE 826 PAGE 37			CODE 258 PAGE 183
Kitchen workers	Dishwashers			Kitchen hands
CODE 850	CODE 850 PAGE 38	CODE 09-04 PAGE 279	CODE 370 PAGE 185	CODE 250 PAGE 181
Firemen and fire protection	Firemen and fire protection	Firemen and fire protection	Fire brigade officers and men	Fire brigade officers and men
CODE 851	CODE 851 PAGE 38	CODE 09-05 PAGE 280	CODE 371 PAGE 186	CODE 252 PAGE 181
Guards, watchmen and doorkeepers	Guards, watchmen and doorkeepers	Guards and watchmen	Watchmen	Guards and related workers NEC

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 853	CODE 851 PAGE 38	CODE 09-06 PAGE 281	CODE 010 PAGE 150	CODE 251 PAGE 181
Policemen and detectives	Policemen and detectives	Policemen, sheriffs, and marshals	Police, other ranks	Police officers and men
CODE 875	CODE 875 PAGE 38	CODE 09-07 PAGE 283	CODE 104 PAGE 153	CODE 256 PAGE 183
Waiters	Waiters	Waiters, bartenders and counter workers	Waiters, stillroom hands	Restauranters, waiters, counterhands
CODE 890		CODE 09-08 PAGE 285		
Service workers, except private household		Other service workers, except private household		
CODE 902	CODE 902 PAGE 39	PAGE 135	CODE 113 PAGE 160	CODE 002 PAGE 132
Farm laborers	Farm laborers	Farmers and farm laborers	Shepherds and other agricultural workers	Agricultural workers NEC
CODE 962	CODE 962 PAGE 39	CODE 11-00 PAGE 288	CODE 111 PAGE 160	CODE 000 PAGE 132
Fishermen and oystermen	Fishermen and oystermen	Fishermen and oystermen	Fishermen	Fishermen
CODE 964	CODE 964 PAGE 39		CODE 7 PAGE 51	CODE 004 PAGE 133
Gardners	Gardners, groundskeepers, landscapers		Gardners, market gardeners and nurserymen	Gardeners and groundsmen
CODE 965	CODE 965 PAGE 39	CODE 11-01 PAGE 290	CODE 321 PAGE 181	CODE 207 PAGE 174
Longshoremen and stevedores	Longshoremen and stevedores	Longshoremen and stevedores	Wharfingers and stevedores	Stevedores and dock laborers

OCCUPATIONAL CROSS REFERENCE TABLE

CALIFORNIA STATE 1959-61	WASHINGTON STATE 1950-71	UNITED STATES 1950	ENGLAND AND WALES 1949-53	ENGLAND AND WALES 1959-63
CODE 970	CODE 970 PAGE 40	CODE 11-02 PAGE 293	CODE 117 PAGE 160	CODE 005 PAGE 133
Lumbermen, raftsmen, and woodchoppers	Lumbermen, woodsmen and loggers	Lumbermen, raftsmen and woodchoppers	Foresters and woodsmen	Foresters and woodsmen
CODE 985	CODE 980 PAGE 40			CODE 188 PAGE 168
Laborers NEC	Laborers			Laborers and unskilled workers; other, NEC
CODE 998				CODE 340 PAGE 199
Students				Students

INDEX OF OCCUPATIONAL TITLES

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